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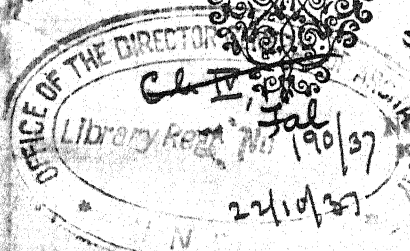
By E. N. FALLAIZE

Honorary Secretary of the Royal Anthropological Institute

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THE ORIGINS OF CIVILIZATION

CHAPTER I

INTRODUCTORY

ANTHROPOLOGY, and in particular that branch of the science known as prehistoric archæology, which deals with man and his culture in the past before written record, as a systematic scientific study is a subject of comparatively recent growth. It is only just over a hundred years ago that the spade of the excavator in Kent's Cavern, Torquay, began to raise doubt in the more open minds of the day whether the orthodox view of the span of man's sojourns on the earth was beyond question, and it was not until the 'forties and 'fifties of the last century that a change from the static to a dynamic view of the problems of human origins made possible the development of a truly scientific method in their study.

The reason for this late development is not far to seek. Curiously enough it is due to the intense pre-occupation of mankind with questions of origins rather than to lack of interest in such studies. There have been few peoples who have not evolved some theory of a divine maker who fashioned the world and the first man, or of some mythical semi-divine hero to whom they owed the origin of themselves as a group, or, if not of themselves, at least of their tribal culture. Osiris in Egypt, Marduk in Mesopotamia, Prometheus, who, with his brother, fashioned man from clay, and

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stole the divine fire for his use, Maui of the Polynesians, and many another, in all ages and in all climes have taken concrete form to answer man's perennial question of whence and by what means he came to people the earth. In like manner poets and philosophers have speculated on the manner of man's life in his earliest days, depicting the ideal state of their dreams as having already existed in the past. Even as the Australian aboriginal refers to an alcheringa—some vague beatific time in the past, whence originated his customs and beliefs—the classic poets of Greece and Rome looked back upon a Golden Age which in their day had degenerated to an age of iron.

Anthropology, the study of man and his origin, thus came to be closely associated with theology and philosophy, and so it continued to be down to modern times. The impulse towards the first-hand observation of facts, which inspired Herodotus in his travels, and the analysis of data by a scientific method formulated by Aristotle, were sterilized by the schools of philosophy and theology of the later classical and medieval times, which, blindly accepting authority for their major premise, solved all problems by abstract reasoning without reference to observation. In the same way, in more recent times, the inductive methods of Bacon and the vast body of facts relating to primitive peoples which were brought together by Hakluyt, Purchas, and others and utilized by Hobbes, by Montesquieu, and by those who began the study of religions and societies on comparative lines in the seventeenth and early eighteenth centuries, were overshadowed by Rousseau and the sentimentalists of that day, who upheld the doctrine of an ideal state of nature and of the essential nobility of natural man from which civilized man had fallen away.

An appreciation of the point of view of earlier theory is necessary by way of contrast to understand

the revolution in thought upon which the principles and methods of modern research in anthropology were based. While it was still believed that at some fixed date, about four thousand years ago, man was created perfect in a state of grace from which he had fallen away, it was impossible that the evidence of his early history should even be recognized as such, or at any rate that its full significance should be dimly guessed. Flint implements, for instance, were not unknown, but the name of "elf-shot," by which they are still sometimes known among the rustic population, indicates how they were regarded. Dugdale, in 1650, wrote of stone celts as weapons used by the Britons before the art of making arms of brass or iron was known. One of the earliest recorded flint implements is now in the British Museum, and was found with an elephant's tooth in Gray's Inn Lane, in the City of London, in 1690, and was identified as an early British weapon. The first systematic excavation was that of John Frere, at Hoxne in Suffolk, in 1797, when he brought to light from the Boulder clay a number of fine implements of the type now known as Palæolithic, which were recognized as early weapons or implements. The discovery was recorded in the publications of the Society of Antiquaries, but was forgotten until it was again brought to notice by Sir John Evans in 1859. It was, however, in 1825, as already mentioned, that serious question was first raised in doubt of the accepted chronology. Excavations carried out in the famous Kent's Cavern at Torquay, by the Rev. J. MacEnery, brought to light implements of human manufacture which were in association with remains of animals that not only had long been extinct in this country—sabre-toothed tiger, cave lion, cave bear, hyæna, woolly rhinoceros, mammoth, and others—but had been definitely assigned to a pre-human antediluvian period. Controversy, in which Dean Buckland, the great authority on palæontology of that day,

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took part, followed inevitably. The authenticity of the find, the human origin of the implements and their association were questioned, but subsequent investigation only served to uphold the first conclusion.

The next discovery of importance was that of Boucher de Perthes, a Frenchman, who found, in association with bones of the mammoth, what were then described as rude flint implements in the gravels of the Somme Valley, gravels which the geological evidence showed to be of a date far more remote than was conceived possible for the existence of man. Yet their finder claimed that they were undoubtedly of human origin. His opponents either asserted that they were due to natural causes acting upon the flint, which, as is well known, is liable to fracture naturally from a variety of causes, or that they were not contemporary with the gravels in which they were found. In 1859 a commission of British archaeologists, of which Sir Joseph Prestwich, the geologist, and the late Sir John Evans were members, was formed, visited the Somme Valley, inspected the site, and examined the implements. Their verdict was favourable to the claims of Boucher de Perthes.

From that date forward, the fact that the culture of man—that is, so far as we can know it—begins with the use of stone for weapons and implements has never been seriously questioned. Later investigations in all parts of the world have confirmed this as true not only of the races who first inhabited Western Europe, but of the peoples in all parts where local conditions provide material suitable for the development of a Stone Age culture. But this was not the only point, nor even the most momentous, that had been established. Once it was admitted that these implements were man's handiwork and that they were at least contemporary with the river gravels in which they were found, the geological evidence showed a far higher antiquity for man than was admitted by tradi-

tional chronology. It is evident to us now that in archæology, as in other branches of science, the trend of thought was veering towards a position favourable to the acceptance of one of the most pregnant of the achievements of the human mind—the formulation of the theory of evolution.

In 1859 Darwin published *The Origin of Species*. The statement of the hypotheses of the mutability of species which it contained, from that time forward revolutionized the study of human origins. The discovery of the first Neanderthal skull three years earlier, in 1856, seemed, to some anthropologists at least, to have afforded evidence in support of the theory so far as man was concerned. Application of the theory was extended and popularized by Darwin's great disciple, Thomas Huxley, and by Herbert Spencer, who, adapting it to his philosophical and sociological studies, formulated a theory of evolution by which he held that he had found a key to problems in fields other than that of biology, to which Darwin's hypothesis properly belonged. The fact that the symmetrical and orderly systems of evolution in the descent of man, in sociology, and in religion, which were developed by enthusiastic adherents of the evolutionary theory, have not stood the test of time in detail is of little moment. What is of importance is that the study of man had been placed upon a scientific basis, and in the study of his culture, material, social, and spiritual, had been embodied the dynamic idea of development in continuity. It is this dynamic idea which is fundamental, for example, in the typological study of culture associated with the name of General Pitt-Rivers, and exemplified at its most highly developed attainment in the museum known by his name at Oxford. It was also fundamental in Edward Tylor's *Primitive Culture*, in which it was applied to the customs and belief of savages and barbarous peoples to show that from the lowest form

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of belief to the highest a line of development could be traced, and that it was a reasonable presumption, for which there was cogent evidence, that even the highest forms of religion and culture had each passed through these stages of development. Still further advance was made possible by the studies of Lord Avebury (Sir John Lubbock), who, by bringing the results of the study of contemporary primitive peoples to bear upon the interpretation of the relics of prehistoric man, explained their use and purpose in the light of analogies drawn from the implements, customs, and the mode of life of man in all parts of the world in recent times.

CHAPTER II

THE METHODS OF ARCHÆOLOGY

THE brief historical sketch given above will serve to indicate the theoretical ideas which underlay the development of anthropological theory and method. In their application to the special problems of prehistoric archæology the aim of these methods is to differentiate and determine the characteristics of any given phase of culture, and at the same time to demonstrate its relationship in character and in time to other phases of culture. The methods of archæology have now been so highly elaborated that it is possible to arrive at a conclusion on both these points with relatively only a very small margin of error.

At the risk of appearing tedious, it is necessary for the proper understanding of archæological theory to explain a little in detail the method employed in dealing with a find in archæological exploration in order to interpret its significance. In the first place, it has to

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be remembered that the greater part of archæological material is now recovered from beneath the surface of the ground. It may be turned up accidentally in the course of agricultural operations, as in ploughing, in excavating for the foundation of a building, in quarrying, or more often in digging in a gravel pit, less frequently in mining operations. On the other hand, the systematic prosecution of archæological research is generally the result of purposive excavation. A known or suspected site of a buried building or city, or a mound known or expected by its character to cover a burial, is purposely explored with the spade. In the case of accidental discovery it is, unfortunately, generally the case that the evidence required by the archæologist is lost beyond recovery. But in the case of the purposive excavation, elaborate measures are taken to secure such evidence by insuring that the exact position of every object found is accurately recorded. Now, it is clear that in digging down in an artificial mound or on a site which is the result of the accumulation of *débris* over hundreds or even thousands of years, and especially where the same site has been used for a succession of buildings or cities, as is usually the case, the uppermost layer will be the latest and the lower the earliest in time, provided no disturbance has taken place. A record, therefore, of the stratum from which each object was taken will give a chronology of all the objects found on that single site in relation to one another. A type of pottery found in the lowest stratum will be earlier than a type found in the highest, it being understood, however, that sometimes a single type may persist through several strata. But in addition to this vertical relationship of sequence, the horizontal relationship of association in the same stratum must be kept in mind. Then, if, by any chance, one of the objects in any given stratum is dateable by reference to a similar object found elsewhere, that fact serves to fix the date, not

only of all the objects found within that stratum, but within certain limits of those in strata both above and below that given stratum. This gives only a relative chronology, it is true, but it may still have an exact meaning for the archæologist. It gives him the stage of civilization of that particular culture. It belongs, let us say for the sake of example, to the late Bronze Age or the early Iron Age, such an identification carrying with it by implication a connotation derived from the study of that period on other sites. Moreover, if the object to which a find is referable has itself been brought into relation with a fixed date, such as, for instance, the reign of Sargon of Agade in Mesopotamia, or with one of the dynasties of Egypt, this gives the absolute chronology, the exact dating, as well. It is possible to say at once that the object is of such-and-such a date. Again, in tracing the relative chronology vertically, it is possible to follow the succession of types, or the successive changes in type, which are the result of conscious modification or of unconscious alteration due to degeneration in copying. It is, then, possible to suggest a probable relative chronology by reference to the type series. It is by a combination of these methods that Professor Sir Flinders Petrie has built up an elaborate series of sequence dates in Egyptian prehistoric archæology, which has proved invaluable in elucidating the results of excavation. By its use any object of an already known type can at once be referred to its proper place in the historic sequence, while an object of a new and unknown type can be "placed" if objects of known type are found in association with it, as is often the case.

For the sake of clearness, the methods outlined above have been explained in their application to the excavation of a city or occupation site, of which the civilization has been of a comparatively advanced type; but the method applies equally to the excavation of

the simple culture of a cave or shelter, such as was inhabited by Stone Age men. Here, however, any animal remains become of great importance. In the later strata they afford evidence of the food in use, or of the domestication of animals, while in the earlier the bones of species that are extinct or no longer found in the area give evidence of date. When we go further back to the earliest stages of culture, even animal remains may fail. The evidence of date may be purely geological. The character of the strata will determine whether the find is recent or whether it belongs to an earlier geological epoch. If the stratum in which an object is found is undisturbed, that object will be at least as old as the date of deposition of the stratum. It may, of course, be considerably older, a fact which will be indicated by abrasions, by signs of weathering, or of water action. This was the case with the Piltdown find, where there were indications of a wash out of an earlier deposit. The earlier types of Palæolithic implements are, as a rule, found in the gravels of river valleys, such as those in which the discoveries by Boucher de Perthes in the Somme Valley were made. Then the criterion of age is, in part, the character of the gravels, in part their height above existing river level. Having been laid down as the river water washed out its bed, the higher they are above present level, the earlier they are in date. Earliest of all are the flints, accepted by some archæologists as implements, which are found in the plateau gravels, belonging to an earlier system before the present rivers had begun to flow in their existing channels.

It may not be out of place here, and as an introduction to what follows, to give the main results attained by the employment of the methods outlined above in the classification and determination of the sequence of cultures in the history of civilization, as revealed by archæological research.

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The earliest culture for which evidence has survived is one of stone, and it is in the earlier stages of flint, or of stone with a similar fracture, which can be worked in the same way. The Stone Age is divided into three main divisions—the Eolithic (the Dawn period), the Palæolithic or Old Stone Age, and the Neolithic or New Stone Age. This is followed by the age of metals, beginning with copper, and passing on to the Bronze Age, which in turn is followed by the Iron Age, these ages being called after the material predominantly in use for the manufacture of tools or weapons, and the sequence of copper, bronze, and iron indicating the chronological order in which they are brought into use. The Iron Age shades off in the historic period with the introduction of written records, although in most cases an inadequate record has for some time still to be supplemented by archaeological research.

In regard to these divisions of the prehistoric period, it must be remembered that although there is evidence that the great historic races have passed through these phases of culture, they have not all lived in them simultaneously. Mesopotamia had entered upon the Metal Age while Western Europe had still some centuries of Stone Age culture to come, and most of the primitive races of to-day were still in the Stone Age when they first came into contact with Western civilization. In other words, although in the Near and Middle East and in Europe these major divisions of the prehistoric period may serve as an approximate chronology, it is a chronology which is restricted to specific areas, and not generally applicable. In strict observance they denote successive phases of culture only.

CHAPTER III

MAN AND HIS ENVIRONMENT

THE task of the archæologist is to piece together the story of early man, paragraph by paragraph, by a process of inference from isolated facts which have more often than not been wrung at haphazard from the bosom of the earth. It may seem remarkable that so much has been recovered; yet it is almost equally surprising that we have ascertained so little, at least, in some directions. It is true that the spade of the excavator has turned over little in proportion to the vast area of the globe.* Commercial exploitation of the earth's resources, such as quarrying and mining, have touched relatively only a small part of the strata which are likely to prove fruitful in relics of early man and his handiwork, and although agricultural operations and the plough have brought to light much that illuminates man's history, it is at a comparatively late stage of his development. The law of chances would appear to weigh against any given discovery. Yet, in reality, the explorer in prehistory is by no means so heavily handicapped as would appear. Man is conditioned by his environment. His place of habitation is determined by circumstances of climate and geographical formation, by site, vegetation, food, and water supply, and the facilities for shelter from the weather. Many of the most important discoveries relating to earliest man have been made fortuitously; others have been the result of consciously directed search. It is only of recent years, however, that systematic endeavours have been made to find evidence of man's place of origin in accordance with the indications of scientific theory. The expedition of the American Museum of Natural History to the Mongolian Desert, which has achieved fame by the

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discovery of the eggs of the dinosaur, had as one of its objects the search for relics of early man and his precursors in an area to which facts already known pointed as a possible place in which man may have passed through the earlier stages of his evolution. It may be that future research, consciously directed in this way, will increase the sum of our knowledge with a rapidity hitherto un hoped for.

The areas in which it might be profitable to search for evidence of earliest man are by no means so unrestricted as the present distribution of mankind might suggest. Increased facilities of transport during the last hundred years have given man an illusive mobility and an adaptability to variation in climatic and geographical environment which is probably more apparent than real. Time alone can show how far the varieties of the human race can withstand successfully transplantation to a widely differing environment from areas to which each has become adapted by a long process of selection lasting over hundreds, possibly thousands of years. It yet remains to be proved that a white man's family, permanently settled even in such favourable conditions as Kenya affords, can endure for more than one or two generations. Culture, as the experience of the last three hundred years has shown, tends to degenerate in an alien environment even when in touch with the homeland. The culture of the Scandinavians who settled in Greenland in the eleventh and twelfth centuries had entirely died out in three hundred years, the settlers by that time having adopted the habits and culture of the Eskimo. The influence of environment and climate had proved too strong for the successful maintenance of a higher standard of life.

While, therefore, it may still be regarded as an open question whether the present generalized distribution of certain varieties of the human race is to be a permanent factor of the future—a matter of the

greatest moment for the development of world resources, and the fate of the backward races—it is undoubtedly the case that primitive man, being less mobile than modern man, was more directly subject to the character of his environment; the limits of his distribution more directly determined by climate. This was, of course, an immediate effect of man's still very imperfect control over material conditions. It is only with the increase in such control that man emancipated himself in any considerable degree from the action of environment, while in correspondence his own reaction upon it becomes more marked.

It must always be remembered that in the study of origins, whether it be of man himself or of his culture, of direct evidence for the earliest stages of development there is none. It is a matter of inference, of weighing probabilities and of judging comparatively or by analogy. In default of direct evidence, any suggested place of origin for man, and any theory of his first steps upwards in culture and their nature, must be pure hypothesis. In framing any such hypothesis, we must be guided by such knowledge as can be attained of the environment in early times, while the directions in which search is made must be determined by the early distribution of such conditions as must have prevailed, in order to admit of the order of development of which we have already learned from the evidence at hand. In other words, the environment must have been of such a character as to make progress possible.

Although it would not be difficult to sketch in general terms the features of an environment which early man must have required for the first stages of development, and to support the argument by the analogy of conditions under which primitive races of to-day carry on their existence, it is both wiser, lest we devise an Anthropological Man similar to the "Economic Man" of bygone theory, and more in-

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structive, to examine the conditions under which man actually has advanced so far as these conditions have been revealed by research. It may, however, be mentioned that the place of origin of man is sought in both Africa and Asia. The former theory is that which was favoured by Darwin, the latter is at present strongly supported by a school of American anthropologists. So far as our knowledge of the climate at that stage of the world's history is concerned, conditions both in the area of North Africa, which is now the Sahara, and in Central Asia would be favourable for the provision of a country not too thickly wooded and well adapted to the support of animal life.

CHAPTER IV

THE PRECURSORS OF MAN

THE study of prehistoric archæology begins in geology and palæontology. In attempting to arrive at some idea of how man first came into being, the anthropologist must look to the work of the palæontologist in tracing the gradual evolution of the animal world from its earliest beginnings. In attempting to estimate the duration of man's existence and to fix the date when he first appears, the anthropologist must ask the geologist for an estimate of time that has elapsed since the strata were laid down in which man's earliest relics appear.

As a result of an examination of the stratification of the rocks of the earth's surface, geologists have classified them in such a way as to divide up geological time into a series of epochs, which, beginning with the earliest, are named Primary, Secondary, Ter-

tiary, and Quaternary, including Recent. It is only with the Tertiary, Quaternary, and Recent that the anthropologist is immediately concerned. The Tertiary Epoch has been divided up into a number of divisions, which have been named according to the proportion of early and recent fauna found among the animal remains. The earliest is the Eocene, so called because it shows the very beginning or dawn of recent fauna, which is followed by the Oligocene, showing a few of the recent fauna. Next comes the Miocene, showing a larger but still small proportion of Recent, and then the last division, the Pliocene, in which there is still further increase. The Quaternary Period begins with the Pleistocene, in which the older type of animal life still survives at the last stage before its extinction. With the Holocene it finally becomes extinct, and modern fauna prevail.

It is necessary that these details, which at first sight may seem outside the scope of the subject, should be kept in mind, because it is by reference to the animal remains, which are found in association either with human skeletal remains or with weapons and implements, that it is possible to refer any given fact to its proper place in the sequence of man's history. For instance, when the tooth of an extinct form of tiger was found in Kent's Cavern in association with relics of man, it at once became evident that, the stratum being undisturbed, man must have existed at a period preceding "recent" times.

It is at present impossible to say with any certainty at what point in the sequence indicated above man first appears. This is in part due to a terminological difficulty, for as yet no satisfactory definition of man has been made. He has been called a "tool-using" animal, but this definition is not entirely satisfactory because some of the higher apes make use of stones and sticks in such a way as to make it evident that if it is not quite correct to call them "tool-using," they

are at any rate on the verge of that stage. Indeed, one ape at the Zoological Gardens a few years ago might almost have been said to have reached the stage of inventing a tool, for in order to break out of its cage it disentangled a strand of wire and, by holding the two ends and pulling the wire backward and forward, it succeeded in sawing through the woodwork. A more satisfactory definition would be to call man a "tool-making" animal, to indicate the purposive modification of material in devising mechanical means towards the attainment of the end. The question of definition, however, is not of very great moment while so much in man's precise line of descent still remains uncertain.

Man belongs to the group of mammals known as Primates, originally, and still, for the most part, climbing animals, which have certain structural features in common adapted to their arboreal habits. A primitive group of primates survives in the lemurs which are still found in Madagascar. An interesting allied form, *Tarsius*, lives in the Indian Archipelago and the Philippines. It differs from the lemurs in several characters, and these differences are such as to suggest that it may represent an advance beyond the lemur in an evolution towards the higher apes. Its most important differentiating characters distinguishing it from the lemur are its flattened face, as opposed to the projecting muzzle of the lemur, and its forward-looking eyes. As Professor Elliot Smith has pointed out, it has made an advance towards the stereoscopic vision, which is of the greatest moment in its effect on the structure and function of the brain and in its development of the capacity for attention.

The higher primates, known as anthropoids, fall into two groups, the platyrrhines or flat-nosed members inhabiting the New World, and the catarrhines or narrow-nosed members inhabiting the Old World. On anatomical grounds man is ranged

in a class with the gorilla, chimpanzee, orang, and gibbon. This fact alone would militate against the theories which have been put forward for the South American origin of man.

It was at one time believed that the anthropoids, beginning with the gibbon, could be ranged in an order of ascent, ending in man, with the gorilla as the nearest relative. Further research, however, has shown that while the gibbon is the farthest removed from man, and the orang shows the greatest degree of adaptation to arboreal life, no one in all its characters approaches more nearly to man than another. Both gorilla and chimpanzee have progressed in some measure towards a life on the ground, and they can and do, to some extent, walk on their hind-legs, but the gap, both in size and in conformation, between the brain of man and the higher apes is very considerable. The projecting muzzle and highly developed ridges for the attachment of the jaw muscles in the ape would alone serve to emphasize the gulf which lies between. Further, the habitually erect posture of man requires a very considerable structural adaption, not merely in the skeleton, but also in the arrangement and balance of the viscera, which can only be the product of a long process of evolution.

It is not possible to say that the original ancestor of man and the apes has yet been found. It can, however, be maintained with reasonable probability that while the apes do not stand in the direct line of ascent to man they do own with him a common ancestor. We may even, perhaps, go so far as to form some idea of this hypothetical common ancestry. In India, in Egypt, and in Europe remains of very primitive types of ape have been found, which are thought to be very nearly related to the original types of the ancestral anthropoids. Of these the earliest known is *Propliopithecus*, from the Oligocene of Egypt, which has been put forward as one of the grounds for

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attributing the origin of man to Africa. Other authorities, however, having in view certain considerations which will appear later, consider that the primitive fossil apes found in the Siwalik hills of India of Miocene and Pliocene age favour an Asiatic origin.

Without going into further detail of a somewhat technical character upon which the conclusions are based, it may be said the generally accepted opinion at the moment is that man and the apes have a common ancestry and belong to the same stock. In the course of evolution the apes specialized in such a way as was best adapted for arboreal life, but that when once they reached a certain stage in that environment they ceased to advance. Man, on the other hand, retaining later the more generalized character of the original stock, has been more readily adaptable to changing conditions and thus has continued to advance through various successive stages until the type of modern man was attained.

This conclusion is by no means entirely hypothetical, for we have evidence of some, at least, of the stages through which man has passed, although from what has been said it is clear that they do not represent the "missing link," which, indeed, must be regarded as a myth.

One of the earliest relics for which a humanoid origin has been claimed must be mentioned, although it does not bear immediately upon the question under consideration. This was a tooth which was found in Nebraska; its human origin has been disputed, notwithstanding the verdict of experts in human dentition. There can, however, be no question as to its age, and if correctly identified it would represent one of the earliest of human relics known.

The most famous of the precursors of man yet discovered is that of *Pithecanthropus Erectus*, the Ape Man of Java, discovered in 1891 by Dubois, a doctor, at the village of Trinil. Parts of the skeleton only

were found, but they are highly significant. The skull cap is low and flattened and has enormous eyebrow ridges, recalling those of the gorilla and chimpanzee. The thigh-bone is curved, but still of such a shape as to indicate that this being walked erect; less erect, it is true, than man, but undoubtedly he did habitually adopt the upright posture and fully merited the name given to him, the Ape Man. It is possible that he may even have been able to talk in rudimentary fashion. The age of the stratum to which the remains belong is not absolutely clear, and some discussion has taken place as to whether they should be attributed to the Pliocene or Pleistocene periods. Probability is in favour of the latter.

Another discovery for which a very high antiquity has been claimed, on the grounds that it represents a midway stage in the evolution between man and the ape, is the Taung's Skull from South Africa, which was found as recently as 1925. The skull is that of an undeveloped individual still at an infantile stage. Professor Dart, by whom it was first described, held that the anatomical characters displayed a very marked approximation to the human type, although it was clearly not of human origin. It cannot be said that these conclusions have been accepted without question, and it has been pointed out, with some effect, that the young of the chimpanzee display many human or humanoid characters, which disappear as the adult stage is reached. It is, however, a specimen of a very considerable antiquity, of importance in the history of the anthropoid stock, and represents an unexpected range southward for the early great apes.

Although this would seem an appropriate point at which to discuss the question of the descent of man, it is convenient to postpone its consideration for a time. The argument will be more readily understood when early types of man have been described.

CHAPTER V

EARLY TYPES OF MAN—THE LINE
OF DESCENT

WHEN we turn to the skeletal remains which can be called specifically human, we find that, although there is ample evidence from which inference can be drawn as to the mode of man's descent, there is little which indicates any direct line of descent, such as was once believed to exist, which would lead back from modern man through Neanderthal Man and Pithecanthropus to the higher apes. Yet in the earlier specimens there is much in their primitive traits to show how certain characters have undergone a process of modification from the ape-like until they have assumed the qualities of modern man.

The oldest skeletal remains of truly human type of which we have knowledge come from Germany. In 1907 a massive jaw was found in the lower Pleistocene gravels at Mauer, near Heidelberg. In addition, two molar teeth come from Taubach, near Weimar, and part of a lower jaw and a child's lower jaw from Ehringsdorf, also near Weimar. Approximately of the same age—possibly a little earlier, possibly a little later, it is not agreed—are portions of the skull, one lower jaw, and a tooth, found at Piltdown in Sussex, England. The last named came to light at different times. The first discovery was made by the late Mr. C. Dawson in 1912. On account of the age of the deposits with which they were associated and their primitive character, they have been christened Dawson's Dawn Man (*Eoanthropus Dawsoni*).

Although the German and the Piltdown remains both belong to the Lower Pleistocene, there are considerable differences between them. The Taubach Teeth are ape-like, and the Ehringsdorf Jaw, although

much mutilated, is also very ape-like in form. This simian character is very marked in the backward slope at the point where the two sides of the jaw join. This in man would be the chin, but in this specimen the chin is practically absent. The Mauer or Heidelberg Jaw is one of the most famous of the early remains of man. Its most striking characteristic, which is immediately apparent to the least instructed observer, is its enormous size and massive character. The ascending ramus—*i.e.*, the square-shaped part of the lower jaw, which rises almost at right angles to the rest of the jaw at the back of the teeth—is extremely heavy and square. It is not very much like either that of modern man or of the chimpanzee. It has a much greater resemblance to that of Neanderthal Man. As in the apes and in most of the early specimens of man, there is practically no chin, although the conformation of the jaw at this point, the symphysis, is well removed from the condition of that of the ape. Certain ape-like appearances on the inside of the jaw, connected with the muscular structure of the tongue, make it improbable that this being could use his tongue for the purpose of talking, even though, as has already been seen, it was probable that *Pithecanthropus* had some powers of rudimentary speech. The teeth are large and strong, but distinctly human. The fang-like character of the canine teeth in the apes is absent. Generally they have the characters of the teeth of some of the strong-jawed modern races such as the Australians. Taking all these characteristics into account, it has been concluded that the Heidelberg Man is to be regarded as an ancestor of Neanderthal Man, to be described presently.

Turning to Piltdown Man, we have a being very different in type, notwithstanding its very primitive characters. The jaw in particular is markedly primitive, so much so that some anthropologists, especially in America, were at first of the opinion that it was

the jaw of an early chimpanzee and did not belong to the remains of the skull with which it was associated. The symphysis is very ape-like, and sloped backwards even more than in the Mauer Jaw; the ascending ramus is broad, but rather more in line with that of modern man than the Mauer. The teeth present a close resemblance to those of the ape in certain details, while the canines project far beyond the others. The jaw as a whole is much more ape-like than the Mauer Jaw. On the other hand, the skull, it has been concluded, approaches the type of modern man. Only fragments were found, and there was considerable difference of opinion as to how it should be reconstructed. The first attempts appeared almost irreconcilable with the character of the jaw, but the reconstruction made by the late Dr. Hunter and Professor Elliot Smith, while in no way affecting its alleged affinity to modern man, by modifications in certain anatomical details at the back, reconciled the discrepancies by putting them in their proper perspective as stages in an evolutionary process. A skull capacity of approximately 1,300 cubic centimetres, which indicates that the skull was capable of accommodating a brain well on the way to the size of that of modern man, fully endorses the view of Professor Elliot Smith that the evolutionary process advanced first by modification in form and increase in the size of the brain. One point of which the importance will be more fully appreciated when the physical characters of Neanderthal Man have been described is that the brow ridges are smooth and do not project as they do in the apes. The Piltdown Skull is held to be that of a female, and therefore it would be expected that it should be of a less massive character than that of a male; but even so it seems reasonable to conclude, when all the characters are taken into account, that here we have an ancestor of modern man in direct line of descent.

The evidence points to Piltdown Man having been contemporary with the Chellean culture of the early Pleistocene. In the Middle Pleistocene, and always associated with the Mousterian culture of the Middle Palæolithic Age, we find the remains of the remarkable type known as Neanderthal Man, from the fact that the first skull of this type was found in a cave on the River Neander, in Germany. It appeared so remarkable that, when it was first found, many doubted whether it was that of a normal man, and not a diseased specimen. Prolonged investigation and the discovery of some fifty examples in different parts of the world have now made it clear that it is normal in the sense that it is in no way pathological, although it is not of the type of modern man. Those who at first upheld its normal and human character were prepared to see in it a stage in the upward progress of man; but it is now the generally held opinion that Neanderthal is a distinct species which branched off from the human tree at some early date, but which, owing to its failure to adapt itself to changing conditions, died out entirely before the intrusion of the modern type, better equipped in mind and body, which appeared in Europe towards the end of the Ice Age. Some anthropologists, however, are still disposed to see in Neanderthal Man a stage directly in the line of human descent. On the ground of certain resemblances it is suggested that the Australians are their modern representatives, the primitive Talgai Skull found in Pleistocene deposits in Australia and the skull from Wadjak in Java, which is described as Proto-Australian, providing connecting links. Others also are not entirely convinced that the Neanderthal people became entirely extinct, and see in some of the skulls of a later period in Eastern Europe a survival of Neanderthal character, while others would also find survivals in some of the modern population of the sea-coast of Frisia and in Northern Germany.

Neanderthal Man is such an important factor in the history of Palæolithic Man that it is necessary to consider his skeletal remains in some detail both as to distribution and to character. He appears on the scene, according to the view which has been adopted here, in a warm period of the earth's history in the Middle Pleistocene. But a little later, with the change in climate to intense cold, Neanderthal Man took shelter in the caves. And for almost the whole of the remainder of the Palæolithic period man was predominantly a cave dweller. The skeletal remains of Neanderthal Man have been obtained by excavation in caves which have a wide distribution. They have been discovered at Gibraltar, Neanderthal, La Naulette, Spy in Belgium, Malarnaud, La Chapelle-aux-Saints, Le Moustier, La Ferassie, La Quina, and in Galilee, Malta, and Jersey. In the two last-named cases the teeth only were found, but the teeth of Neanderthal Man are so characteristic as to make their identification unmistakable.

In geographical range Neanderthal Man thus extends from Palestine to Western France—that is, if we leave out of account a doubtful find in China, in the province of Honan, of a sacrum which may not be human. A skull of strongly marked Neanderthal type has recently been found in the Caucasus. Another example from outside Europe is the Rhodesian Skull, which, however important on morphological grounds, probably is of much later date than the European specimens. Implements of the type usually associated with Neanderthal Man are found in the Nile Valley and in North Africa. This distribution rather suggests that Neanderthal Man originated in Asia and came to Western Europe from the East, afterwards crossing the Mediterranean land bridge into Africa, and that Rhodesian Man may represent an offshoot of this race, which did not entirely die out, but lingered on in the south of that Continent. At present it seems

less likely that the reverse was the process, and that the migration into Europe came by way of Africa. Some authorities would hold that in Eastern and Central Europe Neanderthal Man perhaps existed contemporaneously with the later men of the preceding Chellean culture in France.

As regards physical characters, Neanderthal Man exhibits some little diversity. The Gibraltar Skull and the Galilee Skull both show modifications in form which suggest that they may represent late specimens which had evolved to some extent from the original towards a more refined type. Both, however, appear to be female, and the evidence must, therefore, to some extent, be discounted.

The most marked features of the Neanderthal type are the very heavily marked brow ridges, which project like those of *Pithecanthropus* and the apes, the retreating forehead, low flat nose and projecting muzzle, the large teeth, the heavy massive jaw with its absence of chin, the enormously powerful neck, thick and muscular, the low retreating brow, and the forward thrust of the head, due to the fact that the spinal cord entered the skull by the hole known as the *foramen magnum*, at a point further back than in modern man. The brain case is large, but the brain, as has been shown by casts taken of the inside of the skull, was of a lowly undeveloped type. The legs are relatively short compared with those of modern man, and their form shows that the forward thrust of the head and face was accentuated by the fact that the type did not walk quite erect. Taken as a whole, Neanderthal Man was a low and brutish type, which, in appearance, must have been much like the gorilla or chimpanzee. The famous Rhodesian Skull, which was discovered at Broken Hill in 1921, in certain respects presents an advance on Neanderthal Man; the head was carried more erect, the posture was more upright, and the brain was more highly developed;

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but in its external characters, the receding chin and the projecting muzzle, it was still primitive in type.

With the extinction of the Neanderthal Man we come to a term in prehistory, the end of a phase. From this time on we enter upon the age of Modern Man. In culture at first no very heavily marked difference is to be discerned. But it soon becomes apparent, not only in the physical type of man, but in all the finer distinctions in intellectuality and in delicacy of perception, which may be inferred from differences of physique, and from the more delicate adjustments of means to ends exhibited by the greater specialization of weapons and implements. In the employment of material capable of being shaped more delicately, involving a finer co-ordination of movements, and a more subtle adjustment of hand and brain, the man of the later age stands far from Neanderthal Man. Hitherto man, though well removed from the brutes and substantially advanced on the way of civilization, still retained much of the animal type.

It may not be inappropriate at this point to emphasize the conclusions which emerge in their bearing upon the descent of man in so far as early types throw any light on the problem. A detailed examination of the skeletal character of the anthropoids—Pithecanthropus, Australopithecus (if that individual is not immediately dismissed as an immature chimpanzee), Heidelberg Man, Piltdown Man, and the variations in Neanderthal Man—point to the fact that while there is, in general terms, a well-defined advance along lines leading towards the specifically human, yet there is no regularly graded advance from one type to another which would make it possible to say that any one of the early types is directly ancestral to the other. Neanderthal may represent a stage midway between Pithecanthropus and modern man; but it would be incorrect to say that he stands halfway directly between the two; it would be more in accordance with the

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facts, as we are now able to see them, to say that each of these, with perhaps the exception of the Mauer Jaw, which may be taken as ancestral to Neanderthal Man, stands in relation to the others as the branches of a tree. There is a common stem from which each has branched off at different stages of the growth of the stem. After a period of further development the branch has ceased to grow. The type has become specialized, and this specialization, being at first an advantage in those given conditions, has helped the type to establish itself, but later, as the conditions have changed, specialization has caused the type to die out through lack of adaptability. Neanderthal Man represents an early specialization of the generalized type, and for a time, as the remains of the period show, it has been dominant. Later it has died out, except possibly in the more favourable conditions of Africa, where it survived as Rhodesian Man. The less highly specialized type of modern man has survived, until varieties of this type, too, began to specialize and to pay the penalty. Such a process seems to be taking place at the end of the Palæolithic period, and may explain why, in the modern world, some types remain the backward races and are giving way to the more readily adaptable and less highly specialized white man.

CHAPTER VI

THE DEVELOPMENT OF CULTURE

ALTHOUGH it is difficult to overestimate the importance of the application of the Darwinian hypothesis to anthropological studies, it has to be remembered that it was purely a biological theory. In all strictness it

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was applicable to man only as a member of the animal kingdom. Yet where it was extended by analogy to the study of his culture, and applied to the study of the changes in type and form of material objects, the conception of development in continuity, which was its essential element, proved a revelation in tracing the history of man's achievement in gradually subduing the material afforded by his environment to subserve his needs. Like the string of a pearl necklace, it gave unity and meaning to a multitude of discrete facts. It made possible a scientific approach to the study of the problems of archæology by demonstrating that any given tool or implement of developed type had a cultural history behind it through which it could be traced back, by organically related stages of invention, to its simplest and earliest form. When the flint implements of Kent's Cavern and the Somme gravels were brought to light, they were recognized as the handiwork of early man; but their real significance in the history of civilization was only dimly apprehended. It was only by the application of the principle of evolutionary development, of the conception, of the organic growth, of the more complex and elaborated forms out of the simple, and also by a more complete appreciation of the varieties of technique in flint working, that it came to be recognized that these worked flints, so far from marking man's earliest essays in equipping himself for the struggle for existence, were the product of many stages of development and that they themselves represented a stage only in growth towards later achievement. It still had to be recognized that they were not to be grouped indiscriminately, as the handiwork of early man, with the finer stone working now known to be of a later age.

It is difficult to make clear in abstract language what can be recognized immediately in handling concrete objects. A few minutes' inspection of a collection of flint implements will teach more than

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pages of description. If a series of instruments arranged chronologically is examined, it will be found that any implement of a late and highly developed type can be traced back through a series of modifications, each in itself perhaps very small, until it can be shown to have originated in some quite simple and generalized form. Thus, for instance, a ground and polished stone axe of late neolithic type or a highly finished arrowhead may be traced to the rudest of chipped flints. The Palæolithic implements first discovered stood at some point, perhaps, midway between these extremes, although they do, in fact, represent a high level of achievement in their special technique. This principle of study is, of course, applicable to objects other than flint implements. It is of the essence of the typological or developmental investigation of material culture.

It was such study of the relation of types one to another, in combination with the study of stratification, which made possible the classification of the products of man's early activities on a principle of organic growth into series which were both chronologically and culturally consecutive, and, as such, indicative of man's upward progress, or at times of his degeneration. Sequence in date and sequence in type are the keys to archaeological research.

A cursory survey of the various races of the modern peoples of the world reveals a diversity of cultures, many of a generalized type fundamentally European, others of an advanced type but differing essentially from the European, such as those of India, China, and Japan, while still others stand at different levels of development ranging from the lowest to near the highest and most advanced. Yet, notwithstanding this diversity, the conclusion is inevitable that these varied forms of civilization must have taken their origin from a common stock, just as the many differing races of mankind of the present day must trace their descent

ultimately to a common ancestor. When most of the primitive peoples of to-day first came into contact with European civilization, they were using stone for implements and weapons; and as archæological research has been pursued outside Europe, it has become apparent that the more advanced races have also passed through a period when stone was the only material known for uses for which metal is now employed. Speaking generally, every race, every people, except in certain limited areas, has had its stone age, and there is hardly a country in which stone implements have not been found, sometimes with all the evidence of a high antiquity. It is necessary, however, again to emphasize a caution. Owing to the accidental circumstances that relics of the Stone Age were first discovered and studied scientifically in Western Europe, the phrase "Stone Age," with its various subdivisions, is used for purposes of dating to indicate a more or less precisely defined period of time in Europe or Western Asia. Even here it is not strictly accurate in general application, for Asiatic and Mediterranean countries and also Egypt had reached the metal-using stage some centuries at least before Western and Northern Europe. In other parts of the world, however, it can, strictly speaking, give no indication of date whatsoever, without qualification. Often the Stone Age has endured down to modern times. In California only a few years ago a maker of flint implements for his tribe worked on a ledge of rock in the hills which overhung the railway track, while in Australia bottle glass was always placed at the foot of the telegraph posts in the area of certain tribes to serve as material for their very beautifully made spearheads, and to make it unnecessary for them to steal the insulators for that purpose. Except, therefore, when speaking of Europe, where it is conventionally permitted, the phrase "Stone Age" must be regarded as indicating a phase of culture only.

As it is accepted in general terms that all peoples pass through identical grades of culture in their upward progress, so it is generally agreed that in observing a stone-age people of to-day or of yesterday, it is legitimate to deduce from the uses to which they put their implements and weapons, the purpose of similar weapons and implements of prehistoric man. Similarly, from their customs and beliefs, and especially beliefs connected with personal ornaments, with art motifs, and with methods of burial, to form some idea of the ritual and belief with which man of the Stone, Bronze, and Iron Ages adorned his person, decorated his belongings, and consigned his dead to the grave or the funeral pyre. As to his mode of life, it may be assumed that, granted geographical conditions more or less similar and economic and material conditions more or less comparable, so far as these can be deduced for the earlier period, the habits and methods of an agricultural, a pastoral, or a hunting people will afford a sufficiently close analogy to serve for purposes of interpretation. Certain limitations must, however, be kept in mind. The primitive peoples of to-day themselves may have evolved. They cannot necessarily be regarded as having remained stationary in every respect since their culture was isolated from the main stream of development. Some peoples, not many perhaps, have undoubtedly degenerated, and among those whose standard of living may not have altered seriously one way or another, there may have been a retrogression in certain departments of life. The late Dr. Rivers showed that among certain peoples of the Pacific islands, useful arts which had once been practised had entirely died out.

Yet even granting that we may legitimately make use of the primitive peoples of to-day when we seek to interpret the evidence which early man has left us of his daily life, such a comparison does not assist very materially when we seek the earliest phases of

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human culture, and attempt to picture the beginnings of civilization. The very lowest of present-day peoples, such as the Yahgans of Tierra del Fuego, whose life is passed in conditions so abject as to be hardly conceivable, are as far above what must have been the cultural conditions of earliest man as they must be beyond him in brain power.

As has already been said, it is not clear how far back in the history of the race we are justified in speaking of man specifically. It may be accepted, however, that certainly as far back as the Miocene the ancestor of man had probably started on his upward progress. From that point on we may expect to find evidence of his activities anywhere along the line which stretches to that point in geological time when the skeltetal and cultural evidence alike agree in demonstrating the existence of a being whose human character is beyond question.

Recently considerable attention has been paid to the psychology of the higher apes, and it has been shown that in certain of their mental activities they do exhibit certain approximations to the human mentality, as well as a certain ability in constructive reasoning. One chimpanzee under observation built a ladder of two crates to climb to a bunch of bananas out of reach. Apes will use sticks to bring down fruit, or stones to throw at an enemy. Yet the great apes have not relinquished arboreal life, nor do they of preference adopt the upright posture. It may therefore be no great strain of the argument from analogy to say that in the use of sticks and stones by the apes we may see the first steps taken by the ancestor of man along the upward path, even though it involves the assumption that the apes themselves have remained mentally and physically unchanged in the long period which has elapsed since they split off from the ancestral tree.

In any attempt to fix theoretically, in default of direct

evidence, the point at which a specifically human culture might be said to begin, certain anatomical and physiological considerations must be borne in mind. The adoption of the upright posture as a permanency, by leaving the fore-limbs free, would lead to a rapid increase in skill in their use for purposes other than that of progression. This, together with the greater facilities for observation and comparison afforded by the upright posture, reacting on the brain, would lead to a rapid development in the frontal area of the brain, and consequently to the development of the higher forehead—marked features brought out by the comparative study of such skulls of early man and his precursors as have survived. Structure, function, and culture are closely interrelated in development and react continuously one upon another.

CHAPTER VII

THE EOLITH

REMAINS of the Stone Age are classified into three periods, according to their date in geological time and their type: Eolithic, or remains of the dawn or earliest beginnings; Palæolithic, or remains of the old Stone Age; and Neolithic, or remains of the new Stone Age.

Owing to the heated controversy which has raged over the Eolithic, some authorities prefer the title pre-Palæolithic. This controversy is by no means to be regarded as settled, though perhaps the weight of authority is gradually and slowly turning the scale in favour of the claims for the evidence of a much earlier date for man than was thought possible some years ago.

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The question is this: Granted that the earliest implements and weapons of man, or perhaps of his precursor, were sticks and stones, what is the earliest point at which it can be said there is clear evidence of purposive shaping which would justify us in speaking of a humanly fashioned implement? As will be mentioned presently, at quite an early date in the history of the study of flint implements, claims were put forward for the human origin of certain roughly chipped flints from early geological strata. At intervals ever since then similar finds have been brought forward for which the same claim was made. The opponents of the human origin of these chipped flints have argued against these claims on various grounds. It has been said that they allege a much higher antiquity for man than is justified by the evidence of geology and palæontology. No human or subhuman remains of such an age, it is said, are known or even probable. Then that the flints themselves either did not come from the geological strata alleged, or that such strata were not undisturbed. And, finally, that the fashioning of the flints is not of human origin at all.

In order to make clear this last, and, indeed, most formidable, argument, it must be realized that the implements of early man in the pre-Palæolithic and Palæolithic periods are made of flint or of some similar rock, such as chert. Flint has the property of fracturing under pressure or by a blow into sharp-edged flakes. The size and shapes of such flakes in skilled hands can be regulated to a nicety. That a skilled flint-knapper can shape a flint to the most surprisingly delicate forms can be seen, not only in the work of prehistoric man, but in the work by the gun-flint makers of Brandon in Suffolk. Unfortunately for the history of archaeological studies, man is not the only agency which can produce these fractures. A blow from another stone—as, for instance, when a flint is being water-borne, pressure under earth movement,

frost, or heat—may produce flaking upon which it is difficult even for experts to agree. The upholders of the human origin of the eoliths claim that there are certain signs, product of the technique of manufacture, which are infallible guides, while some French archaeologists maintain that individual judgment based upon handling thousands of specimens, genuine and false, is the only trustworthy criterion.

The so-called implements are, for the most part, either circular or slightly ovate in form, roughly chipped at the edges, or shaped to a beak or point, described as borers or piercers. Of the former, some appear to be scrapers; but all are of a generalized type which might be put to almost any purpose requiring some sort of cutting or piercing edge. Stress is laid upon the immense numbers which show identity of form.

The first claim for the human origin of these very early types was made by the Abbé Bourgeois, who in 1867 described flints from an Upper Oligocene deposit at Thenay. Some of these were said to show traces of fire. This, however, is by no means the decisive argument which the discoverer considered it to be, for a fire may well be due to agencies other than human. Heath fires have, in fact, been observed to produce similar markings. Professor Rutot collected a very large number of eoliths in Belgium, ranging in age from the Middle Oligocene to the Pliocene, while in England Sir Joseph Prestwich and Benjamin Harrison for many years collected eoliths from the plateau gravels above the Darenth, Kent, for which they claimed a human origin. A large collection, some 4,000 in number, of Miocene Age, was made at Puy de Courny, Cantal, in France, by Mr. E. Westlake, but the most important discoveries have been made by Mr. J. Reid Moir in East Anglia. Among the last named were flints of a new type known as rostrocarinate, from their shape; that is, they have a beak

at one end, while one side is shaped like the keel of a boat, a shape which, it was claimed, could hardly be the result of natural causes. However, another distinguished archaeologist, Professor Sollas, has claimed to have discovered similar shapes, undoubtedly due to natural causes, at Selsey Bill. At Foxhall, near Ipswich, Mr. Reid Moir has also found, at a depth of 16 feet in the Red Crag, a Pliocene deposit, a layer containing burnt flints, pot-boilers, bones, and flint implements for boring and scraping, which have been accepted as of human workmanship by the distinguished French authority, the Abbé Breuil. Beneath the Red Crag he has also found eoliths similar to those from the Kentish plateau gravels, but in an abraded condition. He suggests, therefore, that the Kentish eoliths may be earlier than those from East Anglia.

Technical and tedious as the discussion of the eolith may seem, it is obviously one of the greatest importance in its bearing upon the question of positive evidence for the beginning of human culture. Even if the Oligocene flints are rejected—and Professor Sollas is of the opinion that any precursor of man of that age, such as *propliopithecus*, the highest known ape of that age, would not be capable of their manufacture—the Upper Miocene implements found in association with extinct mammals, such as *dinotherium*, *mastodon*, *rhinoceros*, and *hipparion*, must be regarded as still in suspense; but if they should ever be proved genuine they would take us very far back in the ancestry of man, and in view of the purposive character of their shaping—for if genuine they can be classified into several categories, according to their presumed uses—they would argue for the being by whom they were made, even at that early stage, an intelligence far beyond that attained by the highest of the living apes.

CHAPTER VIII

CLIMATE AND THE PALÆOLITHIC AGE

BEFORE passing from the Eolithic to the Palæolithic period, it is necessary to consider the question of climate at this stage in the world's history. The Tertiary epoch witnessed the last of the foldings of the earth's surface, by which the mountain system has been built up. In this case it is that which produced the Pyrenæan—Alpine—Himalayan systems. It began in the Eocene, culminated in the Miocene, and gradually died down in decreasing pulsations, lasting almost to our own day. Each of the great crises in earth motion, according to the palæontological evidence, appears to have produced profound changes in the world's fauna. It is in the Alpine-Himalayan folding that man or his ancestors, birds, and mammals begin and come to play the predominant part. At the close of the Pliocene period the world entered upon the Ice Age, or Ice Ages—geologists are divided in opinion as to whether there were one or more—accompanied by several alternations in land and sea levels which modified the coast-lines to a very considerable extent. Archæologists are, on the whole, inclined to accept the view that there were four Ice Ages or periods of maximum glaciation, which are known as Gunz, Mindel, Riss, and Würm, from the localities in which they were studied, with warm or comparatively warm inter-glacial periods. So far as Great Britain is concerned, however, there would appear to have been three periods of maximum glaciation only, and it has been suggested, and this is supported by the evidence from other areas, that the first glaciation, Gunz, was a local glaciation only.

During the greater part of the Palæolithic period the climate was severe, although it began in genial

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conditions or, to judge by the extinct fauna in the area of North-Western Europe, possibly even sub-tropical. It is perhaps significant that human progress in this period begins and becomes more marked up to a certain point as climatic conditions become more severe, and as the game, which was man's food supply, became scarcer, either dying out or migrating to more congenial conditions. As conditions changed, man adapted himself and his culture more perfectly to the stresses of his environment in habitation, in clothing, and in the greater specialization of his tools and weapons.

The Palæolithic period is divided into successive stages according to cultures, each being named after the earliest or most important of the sites investigated in which that particular type of culture has been found. The stages are the Chellean, called after the locality on the Somme, where these implements were first found; Acheulean from St. Acheul, near Amiens; Mousterian from the Rock Shelter of Le Moustier, Les Eyzies, in the Valley of the Dordogne; Aurignacian from Aurignac; Solutrean from Le Solutré, near Macon; and Magdalenian from the cave of La Madeleine.

Each of these stations, which date in the order named, contains a characteristic example of the culture to which it has given its name. The culture itself has been found distributed over a sufficiently wide area to justify the view that it is not merely a local development, but really represents a stage in the development of the civilization of the old Stone Age.

The two stages first named belong to the Lower Palæolithic, the third constitutes the Middle Palæolithic, and the Solutrean and Magdalenian form the Upper Palæolithic. For purposes of British archaeology it is worth while to remember the original classification into River Drift Implements and Cave Implements, the Chellean and Acheulean belonging to the

former, and the Mousterian, Aurignacian, and Magdalenian coming under the latter category.

It may perhaps make clearer the methods of excavation and dating, as well as the succession of stages, if a typical section be given from one of the French caves, that of Laugerie Haute, in the Dordogne, which happens to be unusually complete. Beginning from the surface, and therefore with the latest in time, the cultures were as follows:

6. Robenhausian (Neolithic)

5. Magdalenian

4. Upper Solutrean

3. Lower Solutrean

2. Aurignacian

1. Mousterian. — *aurignacian*

That is to say, that in opening up the cave the first stratum encountered by the explorers contained implements of a typical Neolithic culture. Digging deeper in undisturbed earth they came upon the succession of Palæolithic cultures in the order named, with typical implements and animal remains which made identification possible, until at last, after they had dug through all the cave earth and débris of successive occupations in superposition, they reached the rocky floor of the cave. This cave is noted in the annals of archæology as that in which the relation in time of the Solutrean and Magdalenian was first fixed by the discovery of the latter in superposition over the Solutrean horizon.

The relation of the two cultures of the river gravels, Chellean and Acheulean, to those of the caves was noted in the early days of their discovery, when it was accepted that the river drift implements unquestionably antedated those of the caves.

Having then established the relation of these phases or stages of culture to one another in time, before

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passing on to a more detailed account of each, it is desirable to indicate their relation to the Ice Ages and the changing climatic conditions.

At the opening of the Palæolithic period, Chellean Man was living in a warm interglacial period, the Mindel-Riss interglaciation, as is indicated by, among other things, the animal remains found in association with Chellean implements in the river gravels. The climate then became colder, until the intense cold of the Riss glaciation developed. This was followed by a warm interglacial period, the Riss-Würm, which saw the further development of the Chellean industry and the rise of the Acheulean stage. As the warm period drew towards its end, Acheulean Man began to be replaced by early Mousterian Man, who, as the climate deteriorated, sought the protection of rock shelters and caves, in which he continued to live throughout the Würm period. This period was followed by a succession of oscillations, in which cold periods, though not of extreme intensity, alternated with warmer, but not warm, periods, in which the remaining cultures, Aurignacian, Solutrean, and Magdalenian, were developed. These great extensions of the Polar ice were not confined to Europe, nor even to the Northern Hemisphere. The great terminal moraines, formed by the gravels and boulders borne before them by the glaciers, are found stretching across North America, indicating that it was equally affected, while the countries of the Southern Hemisphere came under the influence of the South Polar Ice Cap. It was during this same period of violent climatic change that almost equally violent changes took place in land and sea levels. The raised beaches which are found in various parts of the coast-line indicate rises in sea-level of sometimes as much as 100 metres. These were followed by equally marked rises of the land, so that tropical and sub-tropical animals, elephants, rhinoceros, etc., crossed to England

on dry land where the Channel now flows, and also crossed from Africa to Europe by a land bridge which is now under the waters of the Mediterranean between Tripoli, Malta, and Sicily.

CHAPTER IX

THE LOWER PALÆOLITHIC PERIOD

CHELLEAN MAN flourished during one of the periods when the distribution of sea and land was different from that of to-day—a fact which it is important to remember in questions relating to the origin and distribution of the human race. Tide level was then some 600 feet below that of the present day. The Irish Sea, the English Channel, and the German Ocean were broad valleys. Where now is the Mediterranean were two inland lakes; Asia was united with America, by a tract of land extending far to the south, while Europe may have been connected with North America at the Iceland level. Eastward from Britain a continuous tract of land and land bridges led almost to Australia and Tasmania, which could still have been reached by canoe. While the land was thus open to the migrations of man, all parts were equally accessible to the animals, many now extinct, which were induced to come north by the warmth of the climate—elephants of the ancient type (*Antiquus*), the soft-nosed rhinoceros (*Merckii*) with a horn sometimes three feet long, the hippopotamus, and the great sabre-toothed tiger, and many another.

As has been stated more than once,⁸ the implements of Chellean Man are found in the river gravels. The characteristic type is a large, heavy implement some-

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times as much as ten inches long, and roughly of an elongated pear shape. It is very carefully and finely made when the material is of flint, but much rougher when of quartzite, a less tractable material. This implement, known as a "boucher" or hand-axe, is usually found unaccompanied by any other type, and it was for long thought to be the only type made by Chellean Man; but Chellean "scrapers," roughly semi-circular implements with sharpened side, are now known also to occur. The chipping shows that these two implements were carefully flaked for use in the hand and were not hafted. The Chellean industry is very widely distributed. It is found in all the continents of the Old World. It occurs over the whole of France and south of the glaciated area in England. In the north of Italy, as might be expected, owing to the proximity of ice, it is rare, but becomes more common towards the south. It is numerous in Spain and Portugal. Outside Europe it is found from end to end of Africa, in Asia throughout the south, in Palestine, Mesopotamia, and India, and it is said with question to occur in America. It is, however, necessary to repeat here a word of caution against accepting type of implement as evidence of date outside Europe.

The Chellean stage of culture passes into the Acheulean by a regular development. The characteristic implement is still the "boucher" or hand-axe, and is a development of the Chellean but of a much finer, lighter, and more trenchant form. Its edge, made so intentionally by flaking, nearly always is slightly twisted or waved. Later it becomes lanceolate in form. In the early stages of the Acheulean period the fauna are still those of a warm climate; in the later stages cold fauna begin to creep in. The mammoth (*Elephas primigenius*) with its woolly coat and the woolly rhinoceros (*tichorhinus*) appear. The climate was changing.

CHAPTER X

THE MIDDLE PALÆOLITHIC PERIOD

At the end of the Acheulean period there comes a change in technique in the making of flint implements which may not be without its special significance. This is the introduction of the flake as the basis of the implement. In both Chellean and Acheulean industries the base of the implement is the core. A lump of flint is taken, and from it flakes are struck off until it has been fashioned to the requisite shape. These flakes, it is true, were sometimes used for small implements. With the Mousterian culture the boucher disappears, except in the early stages, and the flake takes its place. Of these the so-called Levallois flake is sometimes as much as 15 to 18 cm. in length. From the flakes various implements were fashioned, "points," tools for piercing, cutting, scraping, and sawing, side scrapers which were similar to the point but without its pointed end, and probably employed in scraping the inside of skins in preparing them for use, just as the Eskimo woman prepares skins to-day, end scrapers, notched scrapers, and awls. For the first time we encounter a weapon of offence in a lance-head with obvious notch for attachment to a shaft. This brings us to the suggestion to which the substitution of the flake for the core seems to give rise. The flake is obviously a lighter and, in view of the technique, an easier implement than the core to manufacture. But it is not merely a question of convenience; it is also a question of use. The conditions in which specimens of Chellean industry are found are not favourable to the survival of anything less durable than stone. It is therefore conjectured, on the analogy of other races of similar culture, such as the Tasmanian, of whom we have direct evidence, that

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the Chelleans made a liberal use of wood, especially for weapons. This has now been confirmed by the discovery at Clacton of the pointed end of a wooden spear in association with Acheulean implements and remains of *elephas antiquus*, the older elephant. The heavy Chellean and Acheulean hand-axes cannot be regarded as weapons, nor even as very efficient tools, but they seem better adapted for grubbing roots from the ground. If, therefore, it were permissible to hazard a conjecture at the mode of life of these people, it might not be inept to compare it to that of the Tasmanians and Australians, food gatherers rather than food hunters, their efforts in the latter direction being directed to the smaller game. The Mousterian is a man of more advanced type, a man in the hunting stage, who pitted himself against larger animals, for which purpose a more efficient weapon than a wooden spear was needed, and yet something lighter than a core implement.

The earliest phase of the Mousterian culture appears in a warm period, as has been already stated, both in the Somme Valley and on other sites in France, and in Germany and in Croatia at Krapina. Although characteristic Mousterian sites are found in the gravels of the river terraces and elsewhere in the open, it was in this period that man adopted regularly the rock shelters and the cave as his home to shield him from the rigour of the climate. That weather played a large part in determining his choice is shown by the preference for an aspect facing south or in a direction shielded from the wind. On the other hand, being a mighty hunter, Mousterian Man roamed far and wide, and some shelters show signs of seasonal occupation only—a common characteristic of a hunting tribe. It is possible that Mousterian Man had evolved the bolas, the South American form of lasso, in which a ball is strung at each end of a rope—at least, such is the conjectured use of two lime-stone balls found at La

Quina, which must have required considerable ingenuity to string at the end of a rope, if that use is correctly attributed to them. If any proof were needed of Mousterian Man's prowess as a hunter, it would be afforded by the numerous animal bones found at La Quina, which show the marks of saws used in cutting apart the joints and the scratches of knives in scraping off the meat.

The distribution of the Mousterian culture is a matter of considerable importance in view of its association with the remains of Neanderthal Man. They extend from Britain to the South of France, Malta, Spain, Italy, North Africa, and from the West of France to the Channel Islands, through Germany to Moravia, Poland, Croatia, the Crimea, the Caucasus, and Palestine.

The fauna of the period and the succeeding periods has become characteristically that of a cold climate. The mammoth, the woolly rhinoceros, the horse—Przevalsky's wild horse which still survives in the Dzungarian Desert—the bison, still surviving to-day in Lithuania, and, most characteristic of all, the reindeer, the musk ox, Arctic fox, and other cold loving animals which still survive in the Arctic regions. The cold was evidently intense.

Before passing from Mousterian Man we may mention a not too pleasant characteristic of which evidence is afforded by the human remains found in a cave in Krapina, Croatia. Mousterian Man seems on occasion to have indulged in cannibalism.

CHAPTER XI

*THE UPPER PALÆOLITHIC PERIOD—
I. THE AURIGNACIAN*

WITH the beginning of the Upper Palæolithic period and the introduction of the Aurignacian culture there also begins a new epoch in the history of man. For to anticipate what will be said later when we come to consider the physical character of man of this era, we now enter definitely on the stage of humanity—modern man. The heavy and bestial type of Neanderthal Man disappears and gives way to the so-called Crô-Magnon Man—that is, the man who in essential features does not differ from the man of to-day.

The relics of Aurignacian Man still are found predominantly in caves. His implements are still of stone, but, in addition, bone and ivory are called into use, indicating a greater refinement in taste, not because of the implements themselves but because of the needs they served, and, above all, it is now for the first time that we come upon a development of the spiritual side of man in the artistic activities, the carvings, engravings, and paintings with which Aurignacian Man satisfied some need of his soul, even if it may also have had the material end of securing a constant food supply, as some have conjectured.

The Aurignacian flint industry shows marked advance on that of the Mousterian, although in the cave of Audi, the earliest site assigned to the Aurignacian, the work is relatively poor, and still shows signs of Mousterian influence. But in the caves of Châtelperron, the next in the series, of which the characteristic implement is the Châtelperron point, there is a marked advance to be noted. But the outstanding achievement in flint of Aurignacian Man was

the burin, an implement found in various forms, but of which the essential feature is the removal of a flake in such a way as to leave a sharp facet, which intersects the terminal face at a right-angle. The purpose of this implement was to score deep incisions in a hard material, bone, ivory, skin, or wood, with the greatest neatness. In the Middle Aurignacian the art of flint working reached its highest expression, and the tools show a high degree of specialization for a great variety of purposes. We have now advanced far from the generalized implements of Eolithic days. In the secondary flaking, the Aurignacian retouch, the flaking shows a great feeling of delicacy and symmetry. Here Aurignacian flintwork attains its highest achievement, and in the following period, although a new implement developed, the gravette point, a knife-like flake, the flint work began to decline. This was, perhaps, not surprising. The Aurignacian had by now evolved a great variety in tools, saw, graver, spokeshave, end and side scrapers, and drill, and no doubt used them on a still larger variety of objects of wood which have now perished. But the introduction of a new and more tractable material had no doubt diverted his attention from the working of stone. Bone, tough, yet not brittle, capable of taking a fine point, provided a more suitable material for delicate work, of which the Aurignacian was not slow to take advantage. And so we find awls of the bones of horse or reindeer, netting pins, and infrequently awls and cylindrical rods of ivory. Most noteworthy, however, is the extensive use of personal ornaments in the shape of beads of bone and ivory, or perforated teeth of animals, such as the wolf, for necklaces. It is interesting to find a set of beads in process of making from a rod of ivory or reindeer horn, and to note how the hollow in a section of mammoth ivory was skilfully utilized to save labour and material in the making of a bangle. Of the well-known activities

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of Aurignacian Man as artist, mention will be made later. Enough has been said to show that the advance towards modern man in Aurignacian Man's physique was fully equalled by his advance in culture.

During the Aurignacian period there would appear to have been a temporary improvement in climatic conditions. This, no doubt, corresponded with a temporary retreat of the ice sheet during the last glacial period. It is, at any rate, noticeable that stations of human occupation, for the most part Aurignacian, are now met with greater frequency in the open in the deposits known as löss or brick earth, a deposit of wind-borne dust laid down during the Ice Age and directly due to the peculiar distribution of climatic conditions of that period.

Aurignacian stations have a wide distribution in Europe, extending from Southern Russia to Western France, and from England to North Africa. The culture of these stations is homogeneous in type, though development is to be observed within the type justifying the division into Lower, Middle, and Upper. The fauna remain practically unchanged in character throughout the period and almost to the end of the Palæolithic, with, however, some variation in frequency of different species, at first primitive cattle and horses being the most abundant. The reindeer, however, soon assumes predominance, so much so that to French archaeologists the period is known as the Age of the Reindeer.

Notwithstanding the number of stations found in the open, the caves still continue to be the principal source of our information relating to Aurignacian Man. In Britain the Aurignacian is well represented, especially in the well-known site of Kent's Cavern at Torquay, and in the Paviland Cave in the Gower peninsula in South Wales, where fauna, including mammoth, woolly rhinoceros, reindeer, great Irish elk, bison, hyæna, horse, and cave bear, the last two

the most abundant, were found. Part of a human skeleton, known as the Red Lady of Paviland, was also found here buried in ruddle, or red micaceous iron ore, which has encrusted the bones and coloured the surrounding earth. Many implements of ivory and bone were found throughout the cave earth. The caves of Derbyshire, some of which are now in course of excavation, have produced some interesting finds, especially of the earlier phases. It is, however, in France that the classic sites of the cave period cultures are found. That part of the valley of the Dordogne around Les Eyzies is so thickly studded with caves containing prehistoric remains as to have been named not inaptly the Metropolis of Prehistory. It is here that are found the type sites of Le Moustier, La Madeleine, Laugerie Haute, Laugerie Basse, and many another which have yielded to the archaeologist a rich harvest of relics, throwing a flood of light on the everyday life, the culture, and, when the relics are interpreted by comparative study, on the beliefs of early man. The caves vary in dimensions from the merest shelter under an overhanging rock to extensive caves extending for considerable distances into the cliffs which line the river and valley. The exploration of these caves was begun in the sixties of the last century by M. Lartet and Mr. Henry Christy. The relics which they brought to light were received with astonishment, and sometimes incredulity, in their day, but the investigations which have been carried on since then have revealed many even more remarkable examples of the technical and artistic skill of Palæolithic Man.

In recent years, study of the distribution of the relics of Aurignacian Man has revealed a remarkable feature in the Upper Palæolithic culture of the Central and Western Mediterranean, of which the full significance has perhaps not yet been fully ascertained. Wherever, on any given site in Europe, the succession of cultures

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of the Upper Palæolithic is fully represented, the succession is uniformly Aurignacian, Solutrean, Magdalenian. In North Africa—that is to say, from the Nile Valley to the Atlantic—while the Aurignacian technique is fully represented in the stone implements, it remains the characteristic culture, and the succession of Solutrean and Magdalenian is absent. The Aurignacian is, however, of a somewhat specialized type, and this character becomes more marked as time goes on; so much so that it is regarded as a localized development and is distinguished by the name Capsian, from the site of Gafsa in Tunisia. By some it is thought that the early period of this culture may even have preceded the Aurignacian in Europe. Its distinctive feature is the introduction of long thin flakes of flint. It is conjectured therefore that the Aurignacian culture of Europe is to be regarded as derivative from North Africa. The distribution of Aurignacian sites would indicate that if this is the case it penetrated Europe by way of Sicily and Italy across the land bridge which existed at that early period. It is, at any rate, clear that in the Aurignacian industry the core implement has practically disappeared, and long thin flakes of flint predominate as the characteristic basic form. It is on this ground that the Aurignacian is regarded as a development, not of the Mousterian, but of the Capsian. This view would, of course, be entirely in favour of an African origin. Whereabouts Capsian Man originated is by no means clear. It may have been in the Sahara, or it is possible that he may have come by way of the Sinaitic peninsula from Central Asia.

Two types of Capsian culture are recognized—an eastern or Getulean type, and a western or Ibero-Maurusian type. Both developed along lines to be distinguished from the Aurignacian culture, and both eventually reached Europe. In Europe the centre of the Capsian culture is Spain, which, except in the

extreme north, has no true Aurignacian sites. On the other hand, the Capsian culture in Spain, still apparently true to its Aurignacian affinities, exhibits a very highly developed capacity for artistic expression, but, as will appear in the sequel, along strikingly individual lines.

Before passing to the later cultures of the Palæolithic period, it may be mentioned that the Stone Age culture of Aurignacian type is very widely distributed outside Europe. It occurs in America, in South Africa, and as far east as Eastern Asia—*i.e.*, Indo-China and Indonesia. In China a claim has been put forward for its Quaternary Age. Further, while some archaeologists would relate the stone implements of the extinct Tasmanian peoples to the Eolithic industry, in type, of course, not in date, others—such, for instance, as Mr. Henry Balfour—would regard it as Aurignacian. If, therefore, the character of the Stone Age industries in these remoter areas could be regarded as a criterion of diffusion, there would seem to be reason to regard the Aurignacian as one of the periods of dispersion and splitting off from the original stock.

CHAPTER XII

THE UPPER PALÆOLITHIC PERIOD—

II. THE SOLUTREAN

Just as the close of the Mousterian period witnessed a revolutionary change which involved the disappearance of Mousterian Man, so at the end of the Aurignacian period a similar, if less complete, catastrophe took place. The Aurignacian culture is superseded by a new civilization. The Solutreans appear on

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the European plain, emerging first in Poland and Hungary, where the Solutrean culture directly overlies the Mousterian culture. It is therefore presumed that the Solutrean culture first developed in the east, and, sweeping across Europe, occupied the hunting-grounds of the Aurignacians, who were forced to retreat before the superior weapons of the invaders, possibly to the fastnesses of the Pyrenees. The distribution of Solutrean sites distinctly suggests an invading thrust, which dominated for a time and then died away. The type site of Solutré is near Macon, and an important station in the Dordogne is Pair-non-Pair; but there are no Solutrean stations in France east of the Rhone, none in the Iberian peninsula, Sicily, Algiers, or Phœnicia, nor in the Mediterranean Province, where, as already stated, its place is taken by the Capsian. While there is evidence that the Solutreans reached England, the culture is at such an early stage as to justify the title of Proto-Solutrean, and specimens in any case are rare.

The Solutrean culture was very closely associated with the horse, and it is possible that the people may have followed herds of these animals in their migrations across the European plains. It is suggested, on a doubtful interpretation of markings on a carving of a horse's head, that a beginning may have been made in the domestication of the animal.

The characteristic mark of the Solutrean culture is the exquisite workmanship of their flint implements, which are specially adapted for weapons of offence. They employed a new technique which may have originated in the delicate workmanship of certain Mousterian implements. It reached its highest development in the Upper Solutrean. This was the method of flaking flint by pressure, a method of manufacture made familiar by the practice of some modern primitive peoples, who, by the use of another stone or a piece of bone, force from the flake minute chips of

flint. This makes possible an extreme delicacy of form. In the Lower Solutrean are found comparatively primitive arrow-heads, which, however, already possess a comparatively well-developed tang for attachment to the shaft. It may be mentioned here that it was for long doubted whether Palæolithic man had invented the bow, but the evidence of carvings and paintings seems to place it beyond doubt. It has been suggested tentatively that an ivory point with split end of Aurignacian times was an arrow-point. The use suggested for the early Solutrean points may well be accepted. The efficient bow and javelin which the Solutrean flints would provide is alone sufficient to account for the complete supremacy gained by these people over the Aurignacians.

The weapon or implement which displays the Solutrean technique to the greatest advantage is the so-called laurel leaf, a name which suggests its character sufficiently closely. The workmanship of these implements was never surpassed, even by the exquisitely made flint daggers and spearheads of Denmark in the Neolithic Age. These, indeed, may represent a survival of Solutrean technique. Similar finely chipped implements are found in Egypt, probably also of Neolithic age, although their technique, as well as other evidence, has led Sir Flinders Petrie to suggest that an offshoot of Solutrean culture, starting from the main stock in the Caucasus, reached Egypt through Syria and Palestine, while the main body of Solutrean peoples journeyed westwards to Europe.

One of the most remarkable Solutrean stations is that of Predmost in Hungary, where the Solutrean horizon appears three or four metres below the surface. It is associated with rich fauna, reindeer, horse, Arctic fox, and the remains of 900 mammoths. An ivory carving of one of these animals proved their contemporaneity with man on this site, which had been doubted.

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Bone and ivory continued in use throughout the period, and it is here that we find the first bone needle, pointing to a greater elaboration or at least more highly developed methods in clothing. It has already been mentioned that the characteristic technique of Solutré flint working survived in Europe and Egypt. The same technique appears in America, especially in the Argentine, California, and Mexico, where implements of the closest similarity to some of the Solutrean types have been manufactured. It is, of course, possible that this resemblance may be due to independent development.

CHAPTER XIII

THE UPPER PALÆOLITHIC PERIOD—

III. THE MAGDALENIAN

At the close of the Solutrean period the Aurignacians reappear, but with a culture that has undergone a fundamental change. It has become the culture of La Madeleine. If, as is suggested, the Aurignacians withdrew to the Pyrenees before the invaders, their retreat must have afforded little material for their characteristic industry. Their work in stone degenerated sadly, but, on the other hand, there is compensation in a highly developed industry in bone, ivory, and horn. The flint implements are less elaborate, simple in style, and often lacking in finish. Thin flakes and splinters are converted, with the minimum amount of work requisite, into scrapers, graters, drills, and other simple tools. Their use was not as weapons, but as implements for use in the manufacture of weapons. It must not, however, be concluded that the Magda-

lenian Age is one of degeneration. On the contrary, it attained a substantial advance. Weapons increased in number and in kind, and also became more highly specialized.

The deposits in the caves exhibit three stages, each of which shows a distinct advance in culture. The classification is based upon the development of the harpoon; in the first a harpoon which has no barbs, in the second a harpoon with a single row of barbs, and in the third a harpoon in which there are barbs on each side. Arrow-heads and spearheads show elaboration in the methods of attachment to the shaft, which is affected in a variety of ways, and they seem to have attained the principle of the toggle, whereby breakage of the spear or arrow is averted by making the head detachable in the wound, but to remain attached to the shaft by a thong. Deep grooves on some of the points have been explained as channels for poison, while other markings may be indications of ownership, or a simple script. If this were so it would be the earliest indication of the beginning of a system of writing. Though no bows have been found, naturally in view of their material, certain points too small for spearheads must have served for arrows. The spear-thrower, still in use in Australia, had been developed. A great number of these have been found in the caves of the Dordogne, carved in a single piece and elaborately decorated with engravings or sculptures. One of the best-known of Magdalenian implements, chiefly because of the discussions of its purpose, is the so-called *Bâton de commandement*, an implement of bone or ivory, of peculiar shape, with one or more perforations, for which the most probable purpose is that of an arrow straightener—a use suggested by comparison with a similar implement employed by the Eskimo.

Although the Magdalenians were still hunters, it is evident that much greater attention was now given to

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fishing. Not only were at least some of the harpoons used for this purpose, but the hook and line were in use. A number of curious little bone implements have been interpreted as fish-hooks. Abundant bone needles, fine and well made, have been found, which were employed in sewing the skins from which the dress was fashioned. Their slender character indicates the fineness of the work. They were drilled by a delicately chipped flint awl. Personal ornaments have been found in great variety, made from the teeth of bear, horse, and reindeer, sea shells from the Mediterranean, and even fossils perforated for suspension, as well as pendants fashioned from bone and ivory.

Enough has been said to indicate that the Magdalenian races enjoyed a relatively rich and varied civilization, which, notwithstanding the deterioration in the technique of flint work, represented in all essentials a distinct advance on that of their predecessors. So far as comparison is possible, and in matters of detail in implements and weapons, and especially in methods of the chase, the ancient Magdalenians come very close in culture to the modern Eskimo, in whom, so distinguished an authority as Professor Sollas would hold, we may see their modern representatives.

CHAPTER XIV

THE EPIPALÆOLITHIC PERIOD—THE AGE OF TRANSITION

WITH the close of the Magdalenian period, the Palæolithic Age, properly speaking, comes to an end, and we enter upon a period known as the Epipalæolithic, an age of transition from Palæolithic

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to Neolithic. The earliest culture of this period is the Azilian, so called from the site of Mas d'Azil, in France. It is usually associated with the Tardenoisian, named after its type station of Fère en Tardenois. A great deterioration sets in. A change in climate had vitally affected the conditions of livelihood. Warmer weather with the disappearance of the ice sheets had driven away the characteristic fauna of the Magdalenian period. The mammoth had vanished, the reindeer had retreated to the north, and the red deer had taken its place. Richly wooded forests of pine and birch had begun to take the place of the bare steppes. The teeming game of the previous age had gone and the food supply had been adversely affected.

In the Azilian industry, stag's horn had taken the place of the ivory and bone needles. All needlework and sewing is once more done with an awl. In the working of flint Aurignacian methods appear again in the scrapers and graters and points. The characteristic implement, however, of the Tardenois is the pygmy flint, mostly of geometrical form. The Azilian industry is characterized by a flat harpoon, broad with one, or, more commonly, two rows of harpoons. The only other implements in bone are simple punches, awls, and smoothers. Teeth and shells are still used for personal ornament. The harpoons have a wide distribution, and are found in the south of France, the Dordogne, north of Spain, Belgium, and in Britain as far north as Oban.

The distribution of the Azilian flint implement is not so extended as that of the harpoon. More interesting because more difficult of interpretation is the distribution of the Tardenoisian pygmy flint, with which the Azilian is frequently associated, and with which it is generally contemporary. In the first place, it is normally found on a particular kind of terrain, a sandy heath, not of a kind to encourage vegetation. In the west of Europe Azilian stations with Tardenoisian

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pygmies occur at Mughem, in Portugal, in Southern Spain, the South of England, the North, especially the Pennines, and in Belgium. As the final form of the Capsian, they survive around the shores of the Mediterranean at Mentone, Sicily, Tunis, Egypt, and Phenicia, near Beyrout, while to the east they are found in the Crimea, Poland, India, and Japan. They have been found in East Africa and the American Museum of Natural History Expedition has collected typical specimens in the Mongolian Desert. A typical station at Ofnet, in Bavaria, is remarkable for the large number of human skulls which were found buried in red ochre. They were found arranged in groups like eggs in a nest, all looking towards the setting sun. No skeletal bones were found with them, and it is obvious that the body had been decapitated after death, the rest possibly being burnt on a funeral pyre.

It will be noted that the Tardenoisian implement covers a wide area, and has a very peculiar distribution not easily explicable. It would be tempting to attempt to work out lines of distribution from Central Asia, but the information at our disposal hardly warrants it yet. The utmost to which we may venture at present is that all these centres of Tardenoisian industry cannot well be contemporary; they indicate lines of migration, of which the detail cannot at present be worked out. The evidence from Central Asia points to a comparatively early date in that area. Otherwise, taking the evidence as it stands, the West would appear the most likely centre of dispersal.

Of the purpose of the Tardenoisian pygmies, little can be said, and that purely conjectural. They are predominantly geometrical in form, rhombs, trapezes, triangles, and segments of circles. It has been suggested that they were mounted with some form of cement on wood to form the sawlike teeth of some kind of harpoon. Or it may be that they were used as

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arrow-points for the hunting of birds and small game, for which they would be better adapted than the full-sized arrow-head. The type of country would be adapted to this kind of hunting.

The impression conveyed by the remains of the Azilo-Tardenoisian period is that of an impoverished culture. The scarcity of game consequent upon the retreat of the cold fauna, with the incoming of a warmer climate, had driven these people to rely more and more upon a diet of shell-fish. Vegetable food became more and more an important element, and remains of all kinds of nuts and seeds, acorns, sloes, hazels and chestnuts, and cherries, have been found on their sites. Barley suggests cultivation, but probably it had been gathered wild. The harpoon shows that they caught fish in addition to the shell-fish which they had gathered. In these conditions the flint industry, lacking the stimulus of the earlier hunters, was bound to decline. At the same time, notwithstanding this apparent deterioration, the culture contained the germs of progress, for the great increase in the use of vegetable food was bound, sooner or later, to lead to a rapid advance. As modern primitive peoples show, the food gatherers are on the borders of becoming the food cultivators. Seeds dropped by accident, or plants placed in the ground for storage among an observant people, who have the root of progress in them, are bound to lead to artificial cultivation. This happened in Western Europe, and when the Neolithic era opens we find the peoples of the Neolithic Age engaged in agriculture and domesticating the animals, which, in later Palæolithic times, had taken the place of the Arctic fauna, and in their wild state had formed the staple food of the population. In this phase of the Epipalæolithic period, there are already signs of the approach of those conditions of stable food supply afforded by the practice of agriculture, which are an essential condition of the

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advance in civilization, for which the way lies open at the beginning of the Neolithic period.

The dawn, however, is not yet, and before Europe entered upon the Neolithic phase a period of still further degradation of culture in changing climatic conditions had to be passed.

If the Eskimo are to be regarded not only as cultural representatives of Magdalenian Man, but actually as his descendants, they must have followed closely on the retreating Arctic fauna, and thus have ~~kept~~ in touch with climatic conditions favourable to the preservation of their characteristic civilization. On the other hand, a later remnant of a dying culture, representing a final stage of the Capsian, possibly akin to that represented at Mughern, following tardily northward, encountered conditions even less favourable, from their point of view. They maintained an existence with difficulty in the Maglemose and kindred settlements of Scandinavia and along the southern shores of the Baltic. Traces of this or a related culture are found in France and Belgium, and it is suggested in England in Holderness. Flints of Tardenoisian type survive, while there is an extended use of bone implements. Engravings suggest a possibility of a Magdalenian influence. The people lived on marshy ground and in shallow waters on platforms formed of the trunks of trees. At this period, that of the Ancylus Lake, which was formed by an elevation of the land cutting off what is now the Baltic from both the Arctic Ocean and the North Sea, a milder and moister climate prevailed. A depression of the land brought the Ancylus period to an end, and the period of the Littorina Sea followed, when the waters overflowed the land into the area of the Ancylus Lake. This was the period in which the culture of the kitchen middens flourished. Vast mounds of shells lie along the coast of Denmark, the refuse of a people whose culture is a development or, at any rate, a succession of the

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Maglemosian culture. Showing close resemblance to this culture, it yet marks an advance, for the dog had almost certainly been domesticated, and the making of pottery has been introduced. Living in a hunting or collecting stage, shell-fish, fish, birds, and rarely mammals formed their staple diet. They may have devised a rude form of boat, but whether this be so or not, the introduction of pottery is a sign that while on one side they mark the final stage of degeneration from the characteristics of the great age of stone culture of the older type, on another side they had definitely taken the earliest steps on the upward grade of progress which marked the Neolithic Age.

CHAPTER XV

TYPES OF MAN IN THE UPPER PALÆOLITHIC PERIOD

PILTDOWN MAN, Heidelberg Man, Neanderthal Man—men of the Lower and Middle Palæolithic cultures of Chelles, St. Acheul, and Le Moustier—as they retreat before the man of Crô-Magnon, are as Caliban before Prospero. No other parallel could express more adequately the contrast between the types of the earlier and later men of this prehistoric age. Crô-Magnon Man is modern man. Mousterian Man has vanished, to appear no more.

The type takes its name from the cave of Crô-Magnon, in the Dordogne, in which three skeletons were found, two male, one old, and a female. It is a common practice to use the term Crô-Magnon as a general designation for all men of this later Palæolithic period. As will appear, however,

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strictly speaking, this is not correct. The skeletal remains of man from the various sites extending in time from the Aurignacian to the Epipalæolithic period exhibit a great variety of type.

The true Crô-Magnon type is a magnificent specimen of humanity. In height very tall—the stature of the old man is estimated at 5 ft. 11 ins. The skull has a high capacity, 1,590 cubic centimetres, indicating a well-developed brain. In shape it is long and of a high type. The nose is relatively narrow and prominent; the brow ridges, which were so marked a feature in Neanderthal Man, are only moderate; the cheek-bones are very strong, and the chin is also very strong. A marked and peculiar characteristic, by which the type may always be recognized, and by which, indeed, its survival is inferred in the modern population of Western Europe, is that the face is very broad over the cheek-bones, but at the same time very short—in other words, it is asymmetrical.

In the Grotte des Enfants, Grimaldi, at Mentone, a different type of man has been found. In stature he is short, still long-headed, but with a lower capacity of skull than Crô-Magnon Man, the measurement being 1,375 cubic centimetres. The nose is broad and small, the brow ridges are not developed, but the cheek-bones are strong, while the chin is weak. Other skeletons found in the same district have these characters more or less marked, and on account of the peculiar character of certain features it has been suggested that here we have an intrusion of a negroid people immigrating from Africa. This would agree with the suggested immigration of Aurignacian Man from Africa; if it were not that many competent anthropologists, while recognizing the negroid characters, consider them to be merely modifications not necessarily indicative of African blood. A still further type is that known by remains from Combe Capelle in France and called by that name, which provides a

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marked contrast with the Crô-Magnon type, although itself well advanced. The height of the head is considerable, and it is relatively long; the brow ridges are strong; the cheek-bones fairly wide, while the mouth tends to project forward; the chin, while not so strong as that of Crô-Magnon Man, is better formed than it is in the Grimaldi type. Other skulls of this type come from Predmost, in Hungary. It has been considered to be the typical Aurignacian. Some authorities, however, would associate it with Solutré, a period which otherwise is not represented, or, at any rate, is not known with certainty to be represented, among the skeletal remains of Upper Palæolithic Man. Pending accumulation of further evidence, a certain conclusion is impossible; and notwithstanding the disadvantage of leaving the question thus in suspense, it is preferable to a dogmatic statement which can only represent individual opinion.

Still another type occurs at Solutré, which shows a very close affinity with modern Europeans. The head is high and chin fairly strong; but the skull is much broader than those already described, and the brow ridges are not strong; in stature this type is usually tall. It is to be noted that among the burials on the Solutré site is a woman with a very broad head. She may represent an early incursion of another race of entirely different type, or she may be a survival of an earlier population.

Turning now to the Magdalenian period, further varieties of man are found. Of these, one of the most famous is the Chancelade Man, a type with a fairly strong brow and long face, a long head, and a narrow nose. The distinctive feature is a very high head of a peculiar shape, which is compared to that of a boat. This type had large hands and feet and walked with knees bent. It has been compared very closely with the Eskimo skull, with which some authorities consider it to be practically identical; an interesting con-

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clusion in view of the suggested affinity between Magdalenian and Eskimo culture.

It is hardly necessary to go into further detail in relation to the various types. From what has been said, it will be evident that by the Late Palæolithic period considerable variation had taken place in man, and these varieties were well on the way to establishing racial types, if, indeed, this had not already taken place. In no case, however, is the variation so great nor in such a direction as to cause question as to the justification for placing them all within the category of modern man. They may be regarded on the whole as more or less strongly marked and localized variants of a general type.

It is, of course, generally known that anthropologists classify skulls according to the ratio of breadth to length, and the distinction between long and broad skulls is one of the most generally used differentia of race. The skulls which have been mentioned above and the races to which they belong are long-headed, although an exception has been noted in the case of the female skull from Solutré. At the end of the Palæolithic period, or rather in the Epipalæolithic period, it is evident that a new racial element is beginning to creep in. Sporadic examples of a broad-headed type have been found, one of these with the primitive culture of Mughem in Portugal, another at Furfooz in Belgium. The peculiar collection of skulls found in the caves at Ofnet includes several that are distinctly broad, and the whole collection, in fact, on cultural as well as physical grounds, suggests considerable racial intermingling. In these broad-headed peoples it is possible that we may see the advance guard of the races which were to introduce a new culture from the east and to initiate the Neolithic Age.

CHAPTER XVI

PALÆOLITHIC ART AND RELIGION

TIME and the conditions of survival have left us no relics of the material culture of Palæolithic Man excepting those in stone or some material almost equally resistant to destruction. Of his spiritual life, his thoughts, and beliefs, no record in the ordinary sense has come down to us, and it might be said that we know nothing of them, if it were not possible for us to deduce from the material remains by comparison with modern peoples something of his thought and his feelings, his relation to his fellows and his conception of what happened to him after death.

The most remarkable feature of the culture of the Upper Palæolithic period is the evidence of the artistic capacity of early man which has been found in the caves. It is, of course, well known that many modern primitive races exhibit a considerable degree of skill in the representation of natural objects, but the artistic products of Palæolithic man far surpass anything that has yet been produced by the modern savage. Indeed, in skill, in line, in colour, and in realism, they vie with many of the products of the modern artist.

The first examples of Palæolithic art to be brought to light were the carvings on ivory and bone which were discovered in the caves in the Dordogne district by Lartet and Christy, including the famous engraving of the mammoth on a piece of ivory from a mammoth tusk. For a long time Palæolithic art was known only from these and similar engravings, but in 1879 Señor de Sautuola discovered in the cave of Altamira, in Northern Spain, a remarkable series of paintings in natural colours, mostly of bulls and bison, which subsequent investigation showed could only be the work of Palæolithic Man. Their authen-

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ticity was questioned for many years, but in 1906 their Palæolithic date was finally established by further discoveries about which there could be no question. Since then investigations in the caves of the Dordogne Valley have brought to light innumerable paintings of a similar character.

These early examples of man's artistry first appear in the Aurignacian period, and although it is possible to say that a distinct development is to be noticed in the three forms—painting, carving, and engraving—it is difficult to say with certainty which antedates the others.

There are certain peculiarities connected with the paintings which must be noted, as they have an important bearing upon the interpretation of Palæolithic art. In the first place they are situated in the darkest and least accessible parts of the cave. This would appear to rule out any idea of a decorative purpose. Further, there is not, as a rule, any attempt at grouping. Generally speaking, each painting of an animal stands by itself independently of those in its immediate vicinity. Nor, indeed, does any particular value appear to have been attached to these paintings by those who came after the original artist, for many of the paintings are superimposed on those of an earlier date, obliterating them in part. It must further be noted that the animals depicted are for the most part such as would have served man for food. The paintings of the earlier school, for, as will appear, there are two, do not represent man.

A variety of animals is depicted, but bison and varieties of deer predominate. They are executed for the most part in polychrome, red and black being the predominant colours, but some of them are in monochrome, usually red or black. The modelling is well indicated by shading in colour, but some, especially those in monochrome, show the outline only. The most striking feature is their realism. In most cases

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a characteristic attitude is caught with absolute fidelity. Painting reached its highest development in the Magdalenian age.

On the other hand, carving in the round is perhaps best exemplified in the specimens of Aurignacian age. Here the human form is relatively common, and a number of statuettes of females, it may be noted, have been found in France, Germany, and Austria. Special interest is attached to these ivory statuettes on account of the very distinctive character of the physique portrayed. Two types of woman are shown; one of these is tall, slender, long-limbed, with refined features, so far as these are indicated; the other, short, squat, with enormous deposits of fat over the whole body, but especially in the abdominal and gluteal regions, where, indeed, the form resembles that condition of the Hottentot and Bushman women, known as *steatopygia*. The hair in both cases is indicated, but while the slender type has long locks, which in their form resemble an Egyptian wig, the hair of the short, fat type suggests the closely coiled hair of the African negro. Some interesting speculations on the racial affinities of the Aurignacian peoples have been based upon these differences in physique between the two types, and it has been suggested that we may infer an African strain in the Aurignacian race. This is, perhaps, to some extent, supported by the negroid characters, which some anthropologists find in the physical characters of Grimaldi Man.

Two interesting rock sculptures found at Laussel represent the human form, both male and female. The former is known as "The Hunter" and the latter as "The Venus of Laussel." The male figure appears to be drawing a bow, an interesting confirmation of the existence of these weapons in Aurignacian times. Still further confirmation is afforded by a painting of a bison from a Magdalenian cave in which four arrows are shown in red on its flank. One of

the most remarkable sculptures in relief is a horse in the rock shelter of Cap-Blanc, in which unfortunately the legs are missing. Remarkable modellings in clay of the bison have been discovered recently in the cave of Tuc D'Audoubert.

Some of the implements used by Magdalenian Man, which are decorated, show some wonderful examples of carving in the round. A dagger of ivory, of which the blade is broken off, has a handle which is a life-like representation of a goat or chamois, and there is also a very realistic representation of the mammoth serving as a handle for a similar weapon.

Engravings are found both on the walls of the caves and on implements and weapons. In addition to the mammoth, of which one of the most remarkable engravings comes from the walls of Les Combarelles in the Dordogne Valley, reindeer and most other animals of the period are represented. A well-known example is that of the grazing reindeer from Bruniquel. Outlines of fish are also found. One, which is unusual in the use of grouping, shows a remarkable idea of perspective in a herd of horses in full gallop.

At one time it was thought that Palæolithic Man had of intention avoided the representation of the human form, this opinion being based upon a supposed analogy of certain primitive peoples. For long, indeed, only one or two examples were known, very roughly executed. Of these, one was a group representing a hunter stalking a reindeer. Now, however, several other engravings have been found, which are undoubtedly intended to represent the human form, although it is not easily recognizable. Not only is the execution very rough, but the individuals appear to be wearing masks of animal-like form. The examples from Altamira of Aurignacian age have, indeed, with some justice been termed monstrous. Others, such as those from Marsoulas, of Magdalenian age, while recognizably human, are more like the efforts of the

nursery than those of artists who could produce such wonderfully realistic pictures of animals.

There are, however, two other examples which throw some light, not only on the question of the representation of the human form, but also on the meaning of the art as a whole. These are a bearded and tailed figure, engraved on a piece of schist found at Lourdes, and a painting of a reindeer-like figure with horns and tail, but semi-erect and with human face, from the cavern of Trois Frères. Monstrous and fantastic combinations are not uncommon, such as a lion with three heads, a deer spotted like a leopard, another with the head of a wolf, a horse with two tails and more than four legs, and so on, which may be merely the vagaries of the artists, but, on the other hand, may really have a deeper meaning.

Various conjectures have been offered as to the meaning and object of these paintings, situated as they are in many cases so far in the recesses of the cave that they were painted by the light of fat burning in stone lamps, of which examples have been found, and often accessible only by crawling on hands and knees through low, narrow passages, and in one case, at any rate at present, by swimming through a pool under an archway. It seems at first sight difficult to conjecture why Palæolithic Man should have expended his time and energy on these paintings. Taking all the conditions into consideration, it seems improbable that they represent merely the gratification of an æsthetic sense. It is not unreasonable to assume that here we may safely apply the analogy of modern primitive people, who, whatever may be their achievement in decorative and pictorial representation, rarely do it for the gratification of artistic taste only. The masked human figures and the reindeer-like being mentioned above inevitably point to some form of ritual. The two figures are obviously wearing animal masks and are clearly intended to represent men dressed up in

imitation of animals. The view has been put forward that in all these paintings, engravings, and carvings we must look for some religious or magical motive. The generally accepted explanation is that, by depicting on the walls of the caves the animals that formed their food supply, and by carving or engraving upon their weapons the animals which they intended to hunt with them, they were insuring by sympathetic magic the increase of the animals themselves and insuring their power over them. This would be the reason for representing the arrow-heads in the flank of the bison. By a representation of what they hoped to achieve they thought that they had ensured its achievement. On the other hand, the human figures no doubt represent sorcerers who were performing an animal dance, just as the medicine man of the North American Indian tribes, dressing up as a head of the game on which his tribe existed, such as the bear or bison, and leading a dance in which the action of the animal is imitated, ensures the food supply for his tribe. Attention has also been called to the resemblance of the horned sorcerer of Les Trois Frères cavern to the horned god of the Gauls and Celtic Dys. If a ritualistic meaning is to be sought for the female figures, the physical peculiarities of the stouter lady point to the idea of a goddess of fertility.

Apart from the typical Magdalenian pictorial art found in Northern Spain, examples of artistic activity of another and quite distinct school are found in other parts of that country, notably on the face of a rock shelter at Cogul, near Lerida. Here there is undoubted grouping. The human figure is very commonly portrayed. The character of this school shows a great resemblance to the hunting and battle scenes of the Bushman of South Africa. Here we see hunters chasing reindeer and cattle, using the bow, and women engaged in what is obviously a ceremonial dance around a sorcerer, who stands in the middle of their

circle. The physique of the human beings displayed in these drawings exhibits certain very marked peculiarities. Both man and woman have a remarkably restricted waist, very much like that shown in the paintings of Minoan warriors from Crete. The men appear to be naked except that they wear a kind of garter or fringe around their legs below the knee. The women, on the other hand, wear a skirt reaching to the knee. The peculiar physique of the men, who are steatopygous, recalls the physique of the Bushman, and the general resemblance of this school of art to Bushman art is so close as to lead some to hold that it points to a close relation between the Aurignacian of Spain and the Bushman—that is, that they may both be derived from a common centre of migration, the Bushman surviving in the favourable conditions of his isolation in Africa until modern times.

The suggestion of a connection with the Bushman has received further support from a very curious similarity found in both Palæolithic and Bushman art; but it also occurs in Australian rock paintings. In many of the caves silhouettes of hands have been imprinted on the walls. In some cases the hand has been covered with pigment and pressed upon the wall, while in others the hand has been placed upon the wall and pigment has been blown or placed around it, leaving the outline of the hand in colour on the natural surface of the rock. These hands, both the palæolithic and the modern, exhibit a remarkable mutilation; all of them have lost one or more joints of one or several of the fingers. Various explanations of the custom have been given, among them that it is a sign of mourning.

Before passing to the next development in æsthetic activity of early man, mention must be made of some curious rectilinear engravings which are not unlike the outline of the roof of a house. Hence they have been termed tectiform. No explanation of them is as yet

forthcoming, but in their conventionalized character they seem to point towards the next development in early art. This appears at Mas D'Azil, where Judge Piette found a number of pebbles painted with conventionalized designs. The designs on these pebbles were in great variety, but the larger number usually suggest an upright, with one, two, or more arms, or a derivative of such a figure. It was at once thought that we had here an early form of writing, and attempts have been made to work out an interpretation by assigning a meaning to each of the forms. It cannot be said to have been successful. Another suggestion is that they are connected with ancestor worship and are highly conventionalized representations of the human form. It is possible that this may be the case and that they are the material manifestation of an advance in religious belief on the earlier magic of the Aurignacian. It was no longer believed possible to secure an adequate supply of game by sympathetic magic only, but that by using the conventional representation of the form of an ancestor the hunter could ensure his help and protection.

That the idea of life after death was by no means unfamiliar to Palæolithic Man becomes apparent as far back as Mousterian times, when we first find evidence for reverent and ceremonial burial. Although the more primitive of the backward peoples, such as are found, for instance, among the wild tribes of the Malay Peninsula, may abandon their dead without care to the Bush, others, at a comparatively early stage, by the measures they take either to protect themselves against the ghost, or to insure the well-being of the spirit of the deceased, show that the conception of a life after death has become an article of their faith, and has taken a firm hold on their imagination. The possessions of the dead man may be buried with him to secure that the influence of his spirit, which clings to earth, may not harm the members of his

family, into whose possession they would come, or more often it may be intended that they will serve as a provision for him in his future life. This is shown by the fact that food is included in the funerary offerings. Weapons are placed by him for his defence. His wives, his servants, his horse or other domestic animals, are included in his grave or are placed on his funeral pyre to minister to his needs. That these ideas were familiar to Palæolithic Man is shown by the burials in caves from Mousterian times onwards. The remains of Neanderthal Man in the cave of La Chapelle aux Saints were certainly accompanied by a ceremonial offering of implements and probably of food also, for burnt bones of joints of meat were found. One of the bodies, that of a young man of sixteen, lay resting on its right side on a carefully arranged bed of flints. The right arm was under the head and the left extended. Around the skull were burnt bones and implements, and a carefully dressed and beautifully made hand-axe lay ready to the left hand. In subsequent burials of the dead which have been discovered, orientation—that is, the regular arrangement of the body facing in a particular direction, a constant custom among primitive peoples—the custom of burying the bodies or possibly the bones in red ochre, and the dismemberment of the bodies (witness the detached skulls at Ofnet), all point to beliefs relating to the life after death which are exemplified in the funerary customs of later days.

Finally, the personal ornaments which adorned the corpse, and are found mingled with the bones, point to the belief in the efficacy of the amulet and charm which underlies the primitive use of jewellery or its equivalent.

CHAPTER XVII

CONCLUSION

IN the preceding pages we have followed man in his line of descent, presumably from some still unknown ape-like creature, to his attainment of the type of modern man. We have marked his upward progress, stage by stage, from our first glimpse of the primitive food gatherer, when he has barely acquired the ability to shape material means even rudely to his ends, to the skilled hunter, well equipped with a variety of specialized weapons and implements for offence and defence, for the chase and for his domestic needs. If control of fire constitutes the first great step in human progress, the invention of the bow in late Palæolithic times is little less important as a means, by its range and precision, of securing greater certainty in ensuring the food supply. When we take leave of early man at the close of the period, he is at the point of entering upon that stage in which agriculture and the domestication of animals, by giving him an ever-increasing control over his food supply and freeing him from the constant preoccupation of the struggle for even bare subsistence, was to afford him the leisure requisite for the cultivation and enjoyment of more refined arts of life. We have seen that in art he had already achieved much, and from this achievement we have deduced some form of religious belief. Further, he had attained some conception, vague, perhaps, of the soul and of the life after death. Of the form of social and family organization evolved by Palæolithic Man we know nothing, except that it must have been of the nature common to all hunting hordes—namely, the subordination to leadership and co-operation within the group necessary when hunting game in herds or even

a single head of a species dangerous to life and limb, as were many of those of Palæolithic times.

Lastly, a word as to chronology. Many attempts have been made to fix a term in years for the various phases of the early prehistoric period. These have been based upon estimates of the length of time required for the deposition of the various geological strata. This becomes pure guesswork when the rate of deposition is quite unknown, and, it may even be, the rate of deposition has not been uniform. The only figures to be regarded as in any way trustworthy are those put forward by Baron de Geer for Scandinavia, which are based upon the annual deposits laid down at the time of the retreat of the ice. From these the Azilian period is fixed at about 7,000 years ago, and the end of the last great Ice Age is calculated to be about 17,000 years ago. This would give a date of about 14,000 B.C. for the Magdalenian period. It would not be safe to hazard a date beyond this, though some would offer with some confidence a date of 50,000 B.C. for Mousterian Man and for Chellean Man a hundred thousand years.

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